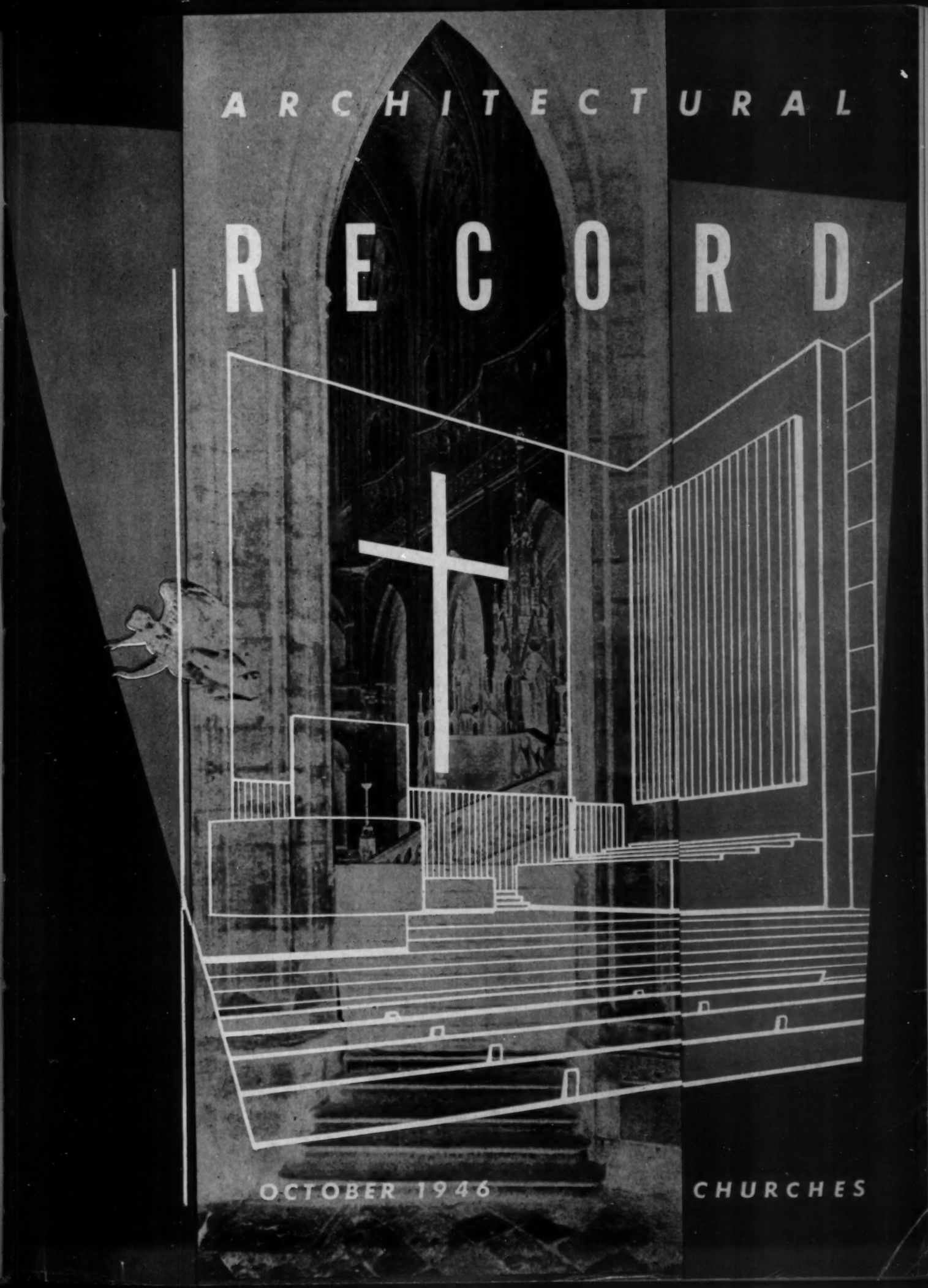
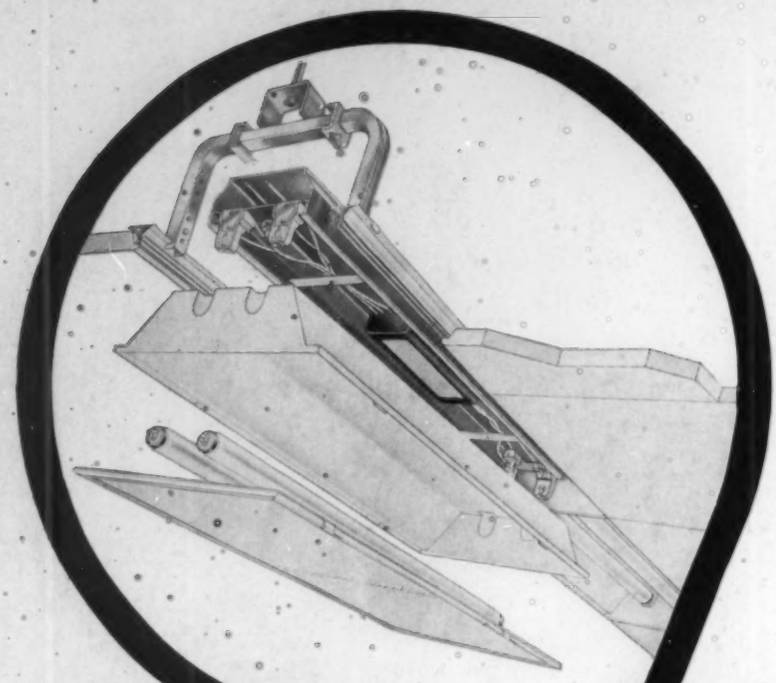

ARCHITECTURAL
RECORD
OCTOBER 1946
CHURCHES



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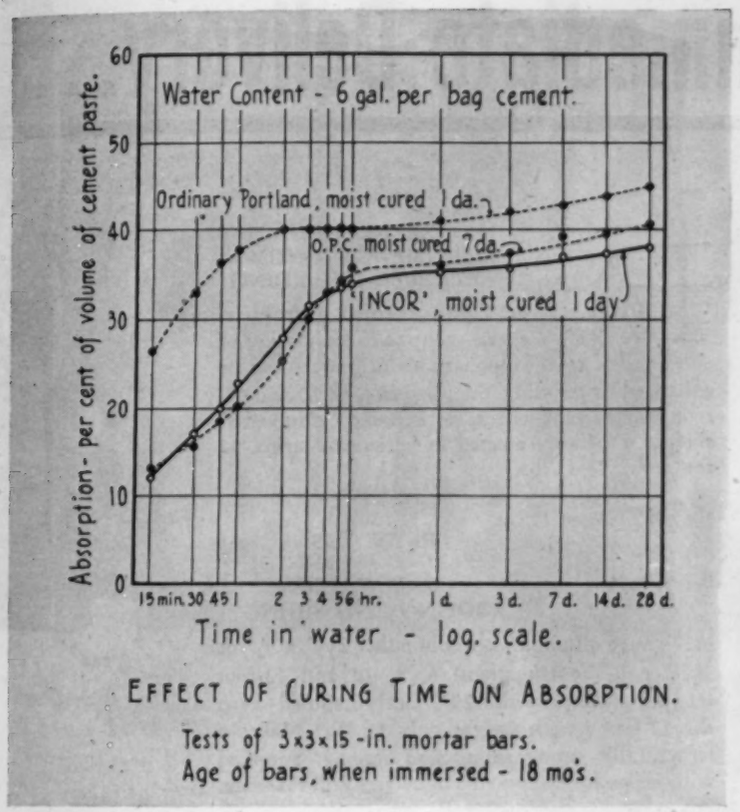
'INCOR' HELPS KEEP WATER

In or Out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40
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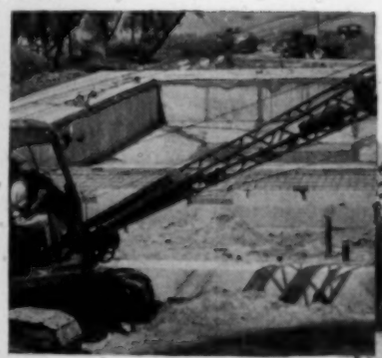
10
0
15 min. 30 45 1 2 3 4 5 6 hr. 1 d. 3 d. 7 d. 14 d. 28 d.
Time in water - log. scale.

EFFECT OF CURING TIME ON ABSORPTION.

Tests of 3×3×15-in. mortar bars.
Age of bars, when immersed - 18 mo's.



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Right, heavy-duty floor at Dr. Pepper Bottling Works, Springfield, Mo. 'Incor' keeps water OUT—longer wear, better service.

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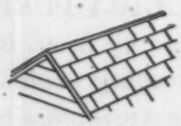

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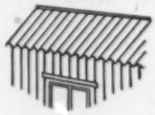

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Our bulletin, "Wrought Iron for Piping Services" will give you some helpful information about corrosion and how to combat it. May we send you a copy?

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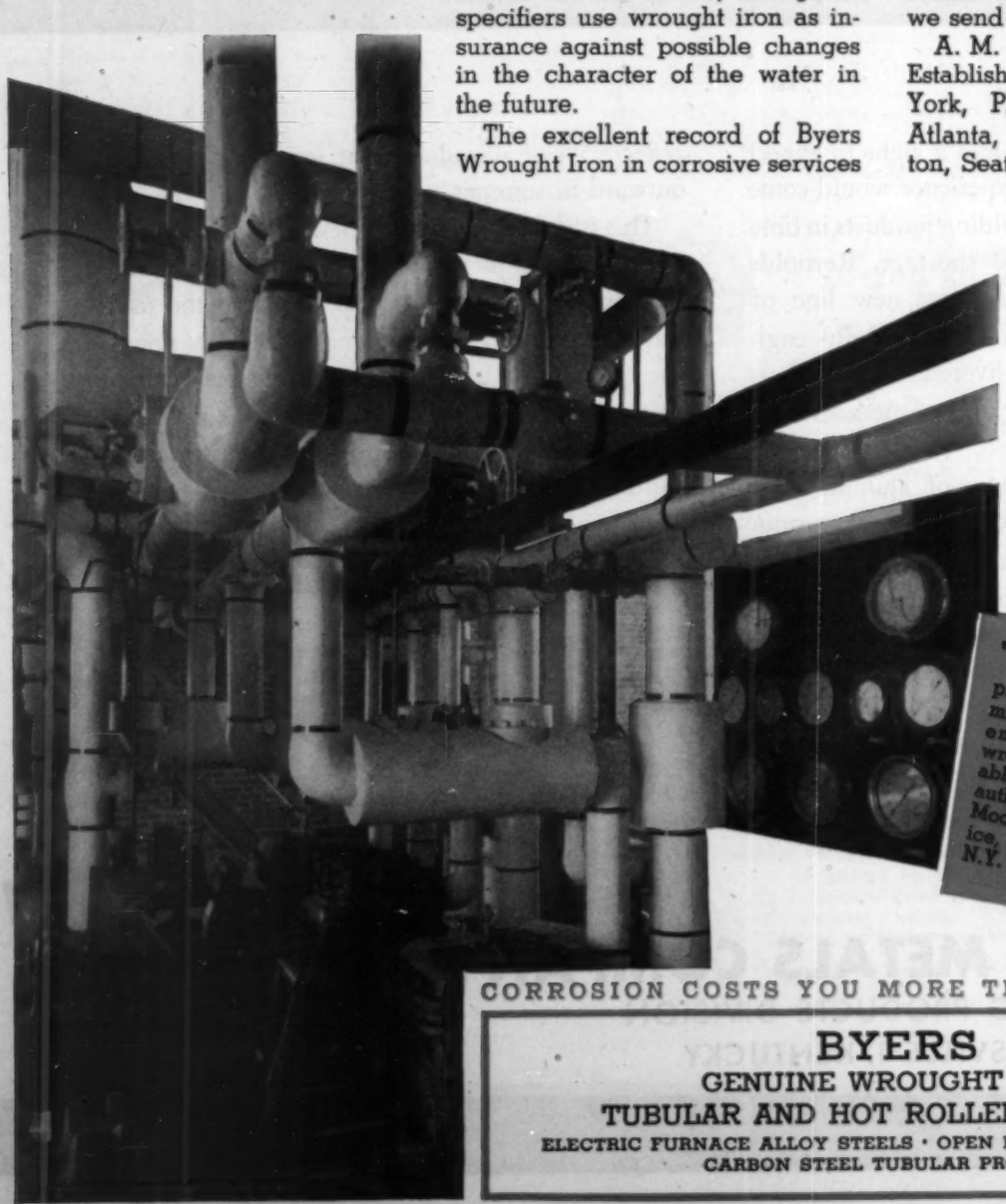

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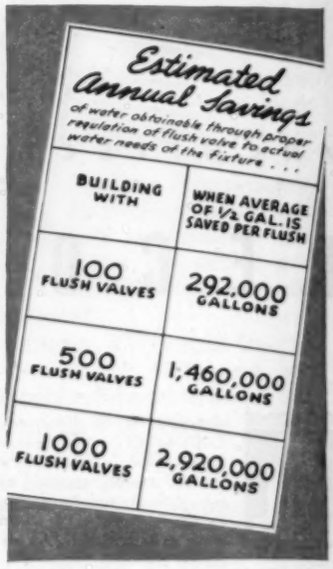
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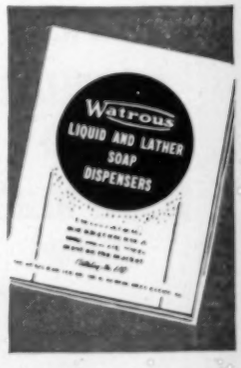

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THE RECORD REPORTS

More Materials Under Priority • Housing Goals Changed • Lumber Output Pushed • Construction Mounts, but Building Collapse is Forecast • New Plumbing Code Promised

October's tumbling leaves symbolize the falling hopes of the Veterans' Housing Program.

Federal officials clung courageously into the late summer to their goal of 1,200,000 "starts" before the year's end. But the picture grew increasingly dark. More and more drastic were the steps taken. Significantly, Expediter Wyatt pulled the levers on new priority powers in September. "Tough action is needed," he warned.

Coincident with this, the NHA chief asked OPA to enforce the maximum sales price and veterans' preference requirements of the program. OPA now can revoke priority aid to builders found guilty of violations. Wyatt also slapped into effect a provision letting an overcharged buyer bring court action for recovery within a year after purchase.

Wyatt anticipates that the demand for houses will grow steadily until the end of the year, and that the rise will more than offset the new housing, so that the shortage will appear more acute than ever.

Priorities Increased

Specifically, the early fall moves increased to 57 the materials under priority, and required dealers to hold indefinitely 75 per cent of such supplies for rated orders. For some items the percentage runs as high as 90 and 95 (mainly for bathroom goods). Aim is to "transfer the materials shortage squeeze from housing to non-housing channels."

Weekly volume of non-housing construction was cut 27 per cent, from $48.8 million to $35 million; cast iron soil pipe producers were directed to make at least 93 per cent of their pipe in housing sizes and its use was limited to sewage disposal systems in buildings; distributors of lumber, hardwood flooring and millwork are to get on an annual basis one-third more housing construction lumber from sawmills and must hold 80 per cent of it for rated orders; they must hold 85 per cent of their millwork for such orders and 100 per cent of hardwood flooring for rated HH and MM (Army, Navy and VA hospitals) orders. Military housing now carries only an HH and no longer an MM rating.

In addition, housing officials emphasize use of substitutes such as metal window sash and cabinets for millwork, bituminized fiber drain and sewer pipe for cast iron soil pipe, etc.

The Commerce Department's production index for building materials, incidentally, shows June 42 per cent above the 1939 monthly average and 70 per cent ahead of December, 1945.

Housing Emphasized

Nubbin of the Wyatt actions was to turn more materials to housing. To use his words: "Non-residential construction cannot be permitted to continue diverting the present volume of materials from veterans' housing. . . . There are thousands of houses and apartments which must be completed — some of which are held up only by a few critical items on which we are placing the chief emphasis of the new drive."

This was at the time the Budget Bureau took under study the advisability of transferring CPA housing controls to NHA.

Meanwhile, Veterans' Administrator Bradley, citing housing and jobs as the two major problems facing veterans, turned the VA spotlight on housing with the words: "The time has come for all of us to throw our weight behind the Veterans' Emergency Housing Program — to treat the housing crisis as we handled wartime emergencies.

"Greater ingenuity and cooperation of communities, builders and supporting industries could, I am confident, rush completion of new dwelling units at a rate far exceeding our present accomplishments."

Housing Goals Shift

Shifts in housing goals came to public attention as far back as August. "On-site" construction starts were upped from 650,000 to 738,000, "conversions" from 50,000 to 100,000, and the temporary re-use program from 200,000 to 212,000. In contrast, the 250,000 target for factory-built homes was cut back to 100,000.

In a September announcement, NHA advised that 607,000 starts had been made by the end of July, two-thirds of them permanent houses and apartments, and the remainder conversions, temporary units and trailers.

NHA began early to admit that its prefabricated housing sights were set too high. Too little weight had been given to the time needed for planning, research, tooling up, marketing and organization, it said. Even so, the guess still is for 80,000 to 85,000 units this year from lumber and plywood and 10,000 to 15,000 from metal and concrete.

Experiments Made

On new experiments in the metal prefabricating group, NHA advises that thin metal sheets are being bonded to a core of various materials, such as plastic-impregnated paper, balsa wood and plywood, and in one case foamed concrete is poured between metal sheets.

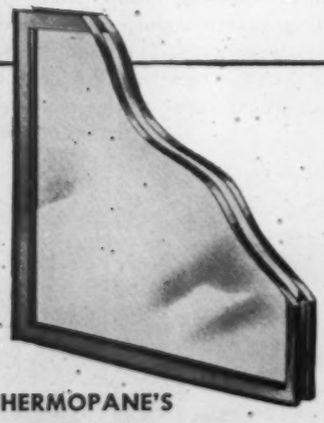
In the concrete group, producers are finding ways to reduce weight by lightweight aggregates, like wood fibers, slag and volcanic rock, and by heat treatment which expands the mixture and

(Continued on page 10)

"But people will talk if you give us a 20,000-cubage biologic area. . . ."
— Drawn for the RECORD by Alan Dunn

Did you miss this announcement in 1944?

IT'S STILL NEWS!



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Why do we refer to this advertisement now? Because everything we said about **Thermopane** has been borne out by the tremendous demand.

All of this adds up to one fact—you can install **Thermopane** with complete confidence... for time has added its proof to laboratory promises. **Thermopane** has proved itself in homes, schools, hospitals, offices and public buildings... in the United States, Mexico, Canada, Alaska and even Iceland.

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a Great Name in **GLASS**

Why are some roofs like a "blind date"?

Because the buyer never knows what he's getting — until it's too late

After a roof is on—it's too late for anyone to wonder if it will give good service . . . or whether it will last . . . or whether you'll be hearing complaints for specifying the wrong materials.

Naturally it pays to consider carefully the materials to be used BEFORE they're specified. Satisfied clients mean repeat business; unsatisfied clients take their future projects somewhere else. Be sure the materials you specify are KOPPERS Old Style Pitch and Approved Tarred Felt. They will give your clients the kind of performance they want.—Koppers Company, Inc., Tar and Chemical Division, Pittsburgh 19, Pa.

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KOPPERS roofing
KOPPERS waterproofing

 (*Continued from page 7*)

cuts weight to a third or fourth of ordinary concrete. NHA points to the possibility of bringing roadbuilders — since the road program is being curtailed — into concrete house construction.

More Prefabs Insured

The Federal Housing Authority reports that many more manufacturers of factory-built houses have been seeking FHA mortgage insurance since the veterans' program began. Before approving a product, FHA sends engineers to the factory to inspect it and to observe assembly methods: Before a ruling is issued the manufacturer must build one demonstration house without FHA insurance.

NHA reported in September that 11 factory-built home manufacturers had applied for market guarantees.

Other developments in the veterans' program include extension of priority assistance to trailer manufacturers to speed up moderately-priced models for former servicemen; requirement for 60 rather than 30 days as the time to hold houses built under the program for sale to veterans; assignment of U. S. Public Health engineers to aid NHA as consultants on health and environmental sanitation; and arrangements for seeking draft deferments for skilled construction workers.

More Ceilings Lifted

Building materials, along with other items, came in for price ceiling boosts as OPA got back into operation during late summer and early fall. Boosts went to hardwood flooring, stock millwork, pine stock millwork, Douglas fir doors, stock screen goods, warm air furnaces, and standard wire nails.

Reseller mark-ups — reflecting increases of 1–3 per cent — went into effect for a list of items, including, among others, asphalt and tarred roofing products, vitrified clay sewer pipe, Portland cement in southern California, asbestos cement roofing and siding shingles, metal lath, New Jersey clay building brick, and clay drain tile in Ohio and Michigan.

Lumber Output Pushed

As lumber production elbowed toward record heights, federal agencies pulled additional strings to stimulate it. The Housing Expediter, under the premium payments regulation, made an agreement with the State of Washington whereby timber for sale on state-owned land will be upped from an estimated 1½ billion board feet to three billion during the next year or more. Uncle Sam will compensate the state for extra "timber cruiser teams." A bi-monthly sale in October was expected to make more timber available to builders and subsequent sales are expected to show increased momentum.

Funds totaling $1,234,000 were allocated to Interior Secretary Krug to build more than 200 miles of access roads to timber lands on Indian reservations with a view to boosting production by 17,000,000 board feet this year and 15,000,000 in 1947. The Forest Service speeded its access road program, which is expected to up timber output by nearly one billion board feet next year and by more than a billion in 1948.

The Department of Commerce warns again that 1946 and 1947 are critical to the lumber industry. "If users of lumber can be substantially satisfied quantitatively, qualitatively, and economically during these two years, and at least token export markets can be maintained," it says, "the future stability of the industry should be assured for many years. Excessive prices, inadequate supplies or inferior quality, or failure or inability to protect its distribution system will encourage substitute materials and may cause permanent injury to the lumber industry."

Housing Costs Watched

In carrying out a policy to keep veterans' housing costs down, Raymond M. Foley, FHA Commissioner, advises that FHA field offices are instructed "to apply only costs found existent for the most efficient builders, rather than for the typical or median builder. They are required to break down lump-sum figures and sub-contract bids into material costs and labor costs calculated on current hourly wages and normal employment practices, plus the normal profit write-up. This scrutiny is designed to uncover unnecessary charges which the general contractor is being required to pay under present conditions, as well as unnecessary items which may exist in his own estimates."

Mr. Foley says home owners are financing property repairs and improvements under FHA at an accelerated rate this year. More than 311,500 loans were reported in the first six months compared to 115,200 in the first half of 1945. The monthly total exceeded 85,000 in June.

Construction Mounts

The Bureau of Labor Statistics comes up with interesting facts on building. To cite a few:

1. Expenditures for new private construction in the first half of 1946 reached the highest half-year mark for more than a decade — $3⅓ billion. This was 3½ times as large as in 1945 and 50 per cent greater than in 1940.

2. In June, for the first month since the 1942 war peak, construction expendi-

(*Continued on page 13*)

General perspective of prize-winning design for proposed legislative palace, Ecuador

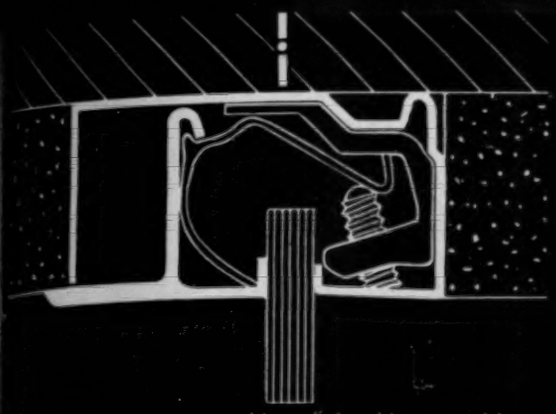
PRIZEWINNERS

First prize of 50,000 sucres (approximately $3,500) in the international competition for the design of a new Legislative Palace, or national capitol, for the Republic of Ecuador has been awarded to two cousins, Robert DuBose Burbank and Charles DuBose of New York. With the award goes the right to execute the working drawings and supervise construction on behalf of the government of Ecuador.

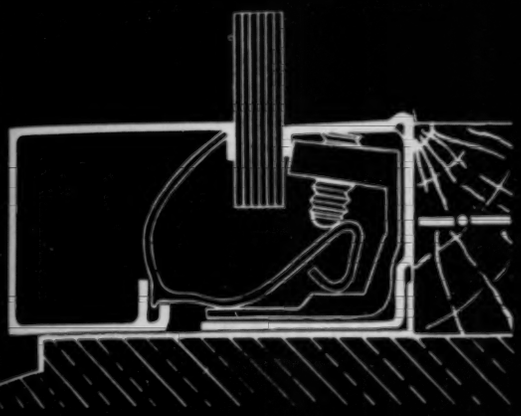
The winning plans call for a dignified, modern palace to be built of andesite, a stone native to Ecuador. Nine stories high and some 300 ft. in length, the building will stand on a hill overlooking the capital city of Quito. To cost about 15,000,000 sucres, it will contain respective chambers for the Senate, Representatives and Plenary Congress, a library, hall of archives, committee chambers, etc.

Winner of the second prize of 30,000 sucres was Carlos Gomez Gavazzo, of Montevideo, Uruguay.

new Features in Construction

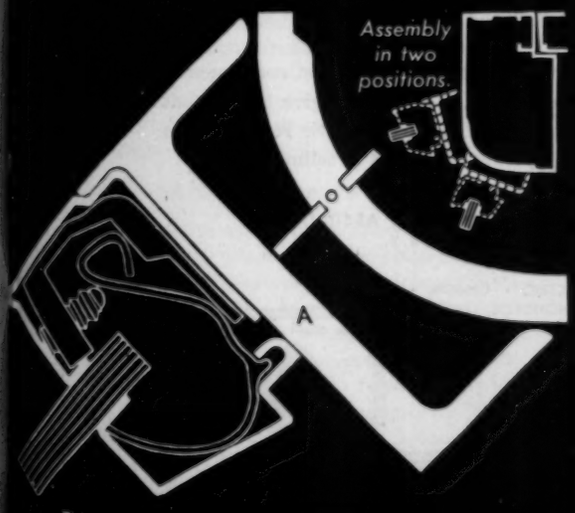


Flush glazing is achieved in this assembly which eliminates projecting metals and makes glass "disappear" into walls and ceilings.



To insure strain-free settings, glazing mouldings have stainless steel spring lugs which maintain a resilient grip along the entire length of glass.

K-47 corner bars are self-adjusting and will receive glass at any angle within a range of 70 degrees without altering the bars.



This K-47 door post receives glass at any angle between 90 and 180 degrees, because the connecting member (A) can be fastened to the post's rounded corner at any point.

The trend in contemporary store front design has made new structural demands on glazing mouldings, metal trim, and entrances. The K-47 Line has been engineered to meet these demands.

Pictured at the left are a few of the new features in construction of the K-47 Line. These features—and many others—enable you to create outstanding architectural effects through the free use of floor-to-ceiling lights of glass, full-vision doors, flush glazing and many other elements of modern design.

And a number of K-47 assemblies, such as the corner bar and door post pictured at the left, have been simplified to obtain a more clean-lined appearance and to make installation easier.

For construction details of the K-47 Line and the Kawneer Standard Line, fill out and mail the coupon below.

Kawneer
STORE-FRONTS

THE KAWNEER COMPANY, 721 North Front Street, Niles, Michigan

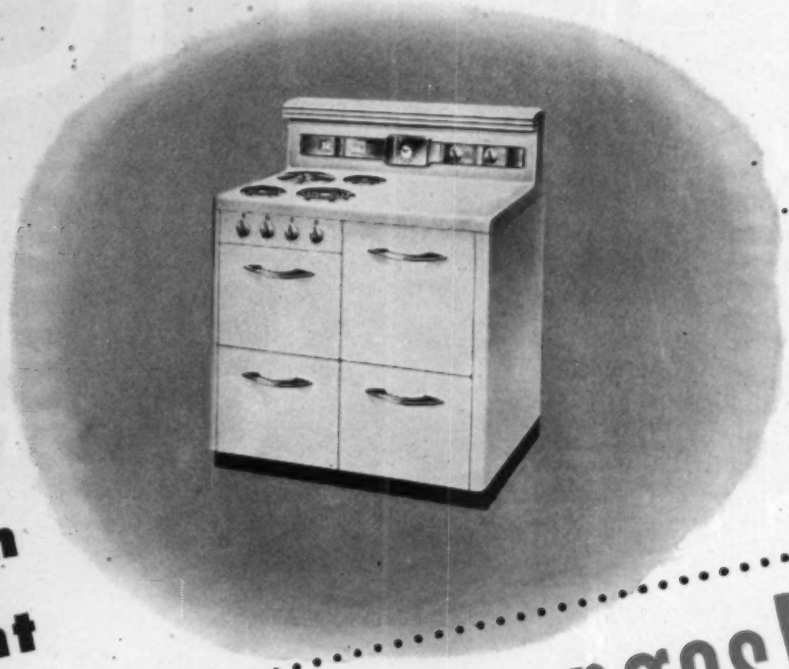
Check portfolio desired. Both will be sent if checked.

☐ Details of the new Kawneer K-47 Line. ☐ Details of the Kawneer Standard Line.

Name_____ Firm_____

Address_____ City and State_____

national magazine surveys* prove women want electric ranges!



The way to find out what women want is to ask them. Leading women's magazines have done that. Here's what they learned:

* **WOMAN'S HOME COMPANION** survey shows that *more* women plan to buy an Electric Range than *any other type!*

* **McCALL'S MAGAZINE** readers made the Electric Range their 2-to-1 "must have" choice in a recent contest.

* **SUCCESSFUL FARMING** survey shows that nearly twice as many REA customers will own an Electric Range after *first* two *postwar* years as "now have" one.

* **HOUSEHOLD MAGAZINE** survey shows that 3 times as many women want Electric Ranges as "now have" them.

* **COUNTRY GENTLEMAN** survey shows that among the upper two-thirds of white farmers, the Electric Range is the 2-to-1 choice!

The answer is that women prefer Electric Ranges for convenience, cleanliness, dependability and economy. The way to give them what they want is easy—wire the homes you build for Electric Ranges! This built-in wiring costs little, but pays big dividends in selling houses.

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TO KEEP THEM MODERN

wire your houses

FOR ELECTRIC RANGES

(*Continued from page 10*)

tures exceeded a billion dollars and employment exceeded two million workers, a million of whom had been taken on since V-J Day.

3. While there was a steady rise in the January–June period in private non-residential building, principally commercial and industrial, the rise in the residential program was 25 per cent greater and was gaining momentum daily.

4. In most parts of the country, one-family dwellings were gaining in relation to two-family and multi-family units.

The Commerce Department finds that in August the dollar volume of housing passed that of non-residential building — $383 million compared to $365 million.

Will Building Collapse?

Likelihood of a collapse of the current residential building boom by late next year is cited in a Federal Reserve Board study of the housing market and needs. In a footnote to the study appears this comment:

"Prices of existing houses advanced during the war, and the advance has continued, apparently at a more rapid rate, since the end of the war. The cost of building has risen in roughly the same proportion as the prices of existing houses.

"There are probably enough families who have savings and borrowing capacity to form a market for new houses, as far as down payments are concerned, even at higher prices than now prevail; but the current payments required to carry the large mortgages with which houses are being bought are a serious charge on income. Every further increase in prices will reduce the number of families able to meet the current charges, and any decline in incomes, even if it is temporary, will leave many owning families unable to fulfill their mortgage contracts, and would-be buyers unable to assume mortgage obligations. In these circumstances, prices are likely to decline.

"If prices turn down before costs have overtaken them, building may be sustained, but if, as seems more likely, costs are as high as prices when the decline comes, building will be curtailed."

Surpluses Regulated

At the close of summer, priorities went into effect for surplus building and utilities materials and equipment held by the War Assets Administration. These give the veterans' housing and hospital construction programs a prior claim on more than 80 types of surplus building items. Advertisements by WAA regional offices 10 days before each sale are used to notify persons entitled to these prior claims.

WAA has allocated $3,000,000 to the U. S. Corps of Engineers for dismantling of Army and Navy installations which contain housing materials, including wood framing, roofing, plumbing fixtures, electric wiring and fixtures, and fiber siding.

Tax Ruling Issued

As an incentive to the construction of new rental housing, the NHA chief worked with Secretary of the Treasury Snyder and the Internal Revenue Commissioner on a ruling to allow builders and owners of multi-family rental projects to step up the rate of depreciation for tax purposes. As issued by the Internal Revenue Bureau, this ruling permits depreciation for tax purposes at more than 3.75 per cent in the early years after construction.

Land-Utilities Surveyed

NHA reports little difficulty on availability of land or public utilities in the Veterans Housing Program. A survey of 51 cities, it says, shows a trend toward concentrating new construction in serviced areas, although land and utilities are expected to become increasing obstacles.

While prices of both raw and improved land have increased, the survey disclosed that most builders are not under immediate pressure to acquire land in the current market.

Plumbing Code Promised

A uniform plumbing code is being developed by a committee under NHA auspices with a view to amplifying wartime emergency standards to permit use of postwar plumbing improvements. The code is due to be ready by January 1. Extensive tests of techniques and materials are being made by the National Bureau of Standards.

Feasibility of national uniform plumbing standards was demonstrated during the war, says NHA, when emergency standards were set up in 1941 and made mandatory for the duration.

Personnel Changes Made

Top personnel changes have been taking place in recent weeks in federal housing units. Dillon S. Myer, former head of the War Relocation Authority, has been named Commissioner of the Federal Public Housing Authority, succeeding Philip M. Klutznick, subject to Senate confirmation when Congress reconvenes. Joseph L. Rauh, ex-staff officer to Gen. Douglas MacArthur, succeeds Admiral Kirby Smith as general deputy to Housing Expediter Wyatt. David L. Krooth has moved from the general counsel's post in FPHA to the same post in NHA, which had been held by Leon H. Keyserling. Philip M. Glick, former Assistant Director of the

(*Continued on page 14*)

SURVEYS SHOW

demand for electric water heaters going... UP UP UP

The Trend is to *Electric* WATER HEATERS

In the 6 prewar years, sales of Electric Water Heaters almost tripled. And a 1943 contest conducted by McCall's Magazine shows that 2.4 times as many women wanted Electric Water Heaters as now have them. They're "the coming thing," because they're:

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THE RECORD REPORTS

(*Continued from page 13*)

War Relocation Authority, succeeds Mr. Krooth at FPHA. Allen Coe follows Gordon Rieley as Director of OPA's Building and Construction Division.

Wages Codified

Following the revival of OPA, the Wage Adjustment Board issued new codified regulations to govern wage payments in building construction. Included in the rules was one allowing a contractor, without advance approval, to increase his wage rates to any higher rates already sanctioned by the Board for the area in which the contractor operates.

With A.F. of L. and C.I.O. advisory councils on housing work in action, NHA announced that work stoppages affecting the housing program hit a low point in July.

❖ ❖ ❖

MATERIALS ROUNDUP

Production of most key construction materials registered substantial increases in the first half of this year, compared with the first six months of 1945, the Construction Division, Department of Commerce, reports. Some of the highlights of the report are:

Steel. The high rate of increase in steel output evident in recent months is expected to taper off because of continued shortages of pig iron and scrap. Producers are far behind on commitments. Issuance of priorities for steel for building materials will be continued into the fourth quarter.

Lumber and Lumber Products. Total output of lumber is expected to pass the 32-billion-foot goal set for 1946, but supplies of several important lumber products — particularly millwork, hardwood flooring and softwood plywood — continue inadequate to meet requirements.

Clay Products. Although output of clay products increased substantially during the first half of 1946, supplies will continue tight in spots owing to heavy order backlogs and increasing demand.

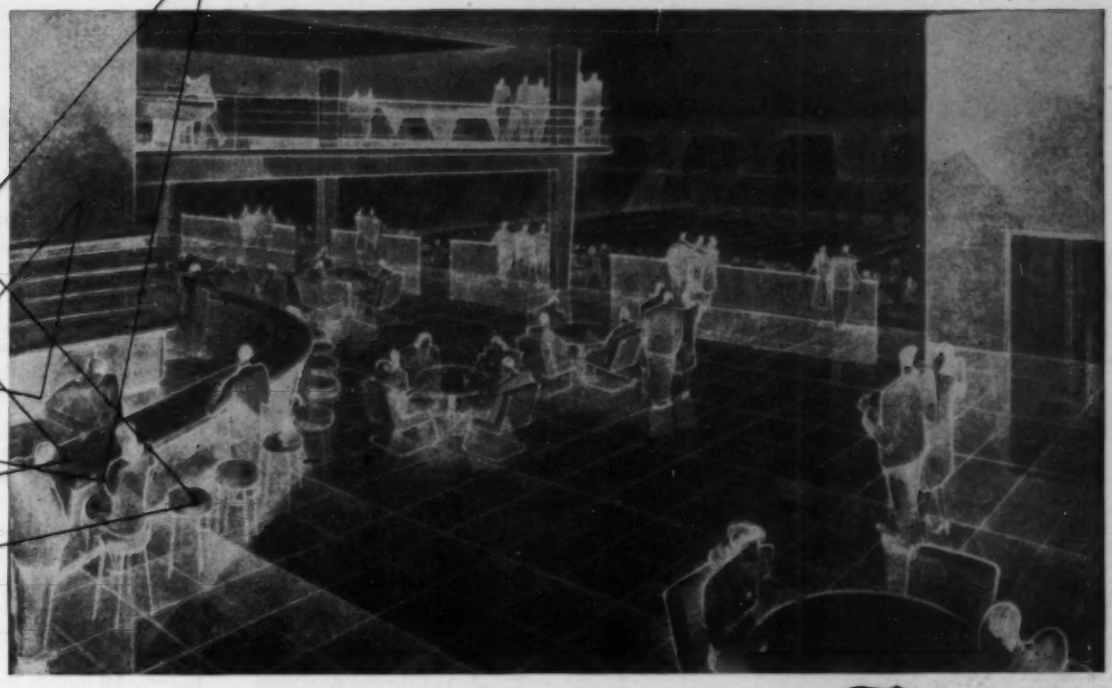
Cement. Output for the first half of the year — 69,600,000 barrels — showed a gain of 64 per cent over that for the corresponding period of 1945, and of 14 per cent over that for the last six months of 1945. June shipments exceeded production by less than 1 per cent. This was the first month in 1946 in which stocks were not heavily depleted.

Gypsum Board and Lath. Average current output is about equal to new orders.

Cast Iron Soil Pipe. Unfilled orders equal about 12 months production at the

(*Continued on page 16*)

a new service to architects



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Photograph by Fabian Bachrach

Edgar Lynch, Architect, directs activities of the new Brunswick Architectural Research Department. In practice since 1929, he interrupted a noteworthy career as architect and consultant to outstanding Chicago and New York business and realty firms, to collaborate with Donald Deskey Associates on the original concept of this Brunswick service.

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Manufacturers since 1870 of many products in Bronze, Aluminum and other metals

THE RECORD REPORTS

(*Continued from page 14*)

estimated June rate.

Concrete Building Block. Output continues inadequate to meet demand.

Nails. Third-quarter output expected to be at a near-normal rate.

Plumbing and Heating. Production of plumbing fixtures remains inadequate to fill requirements.

BUILDING NOTES

Veterans' Villages

Plans have been announced by McCloskey Homes, Inc., for two small-house developments in the Philadelphia area, the first in a series of large-scale home building projects for veterans planned by the company.

The first of the two developments, to be known as Whitemarsh Village, will occupy a 265-acre tract in the Chestnut Hill area just outside Philadelphia. Plans call for the erection of 1,000 all-masonry homes of six and seven rooms, each on its own quarter-acre plot. The price range will be from $8,800 to $9,800.

The other development already announced is Academy Gardens in northeast Philadelphia. To cover a 223-acre site, it will provide 1,500 all-masonry homes expected to sell at from $7,500 to $8,500. All houses in both groups are for sale to veterans only.

VA Hospitals

Army Engineers have let architect-engineer contracts for three more Veterans Administration hospitals, located at Wilmington, Del., Omaha, Neb., and Fresno, Calif.

Massena and DuPont of Wilmington have the contract for the hospital at Wilmington, a 300-bed general medical and surgical institution estimated to cost $4,950,000. The Omaha contract was let to Ellerbe and Co. of St. Paul, Minn., and the Leo A. Daly Co. of Omaha. This is a 500-bed general medical and surgical hospital with an original estimated cost of $6,825,000. The Fresno contract was awarded to Masten, Hurd, Huber and Knapik of San Francisco, for a 250-bed general medical and surgical hospital, the original cost of which is estimated at $4,445,000.

P.I. CONSTRUCTION

The U. S. Engineers have awarded a large C.P.F.F. contract for all their construction in the Philippine Islands to Johnson, Drake and Piper, Inc., of Minneapolis, Minn., New York City and Oakland, Calif.; the Utah Construction Company of Ogden and Salt Lake City, Utah, and San Francisco, Calif.; and Grove, Shepherd, Wilson and Kruge,

(*Continued on page 18*)

Glad Tidings

FROM YOUR TOWER AT

Christmas

WITH

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● Let your church tower pour out the ever glorious songs of The Saviour's birth through the rich, golden voice of Schulmerich Carillonic Bells. Here is the instrument best fitted to translate the *songs of the ages into songs in the air,* with tones of purest beauty.

You may have the joyous voice of Carillonic Bells in your church this Christmas. No season could be more appropriate than this, to dedicate a memorial that proclaims joy and peace to heart and home. Early inquiry is necessary if installation by Christmas is desired.

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AR-C-14

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THE RECORD REPORTS

(*Continued from page 16*)

Inc., of New York City, Washington, D. C., and St. Louis, Mo. The three firms, which have had wide experience on Army and Navy construction both in the United States and abroad, will operate jointly as Drake-Utah-Grove. Headquarters have been established at Sausalito, Calif., and in the Marsman Building, Manila.

ARCHITECTS ORGANIZE

Meeting in Cheyenne in June, the qualified architects in Wyoming organized the Wyoming Society of Architects. The following officers were elected: president, Fredric Hutchinson Porter, A.I.A., of Cheyenne; vice president, Leon C. Goodrich, A.I.A., of Casper; secretary, G. C. Hollo, A.I.A., of Cheyenne; treasurer, C. W. Shaver, Jr., of Sheridan. R. Walter Bradley, Cheyenne, Armand Kellogg, Rock Springs, and F. I. Byerly, Thermopolis, were elected to the board of directors. The current membership of the group is 17.

AT THE COLLEGES

New School

The first school of architecture in seven states in the Colorado and Rocky Mountain region was established at the Civic Center campus of the University of Denver with the opening of the fall quarter. Director is Carl Feiss, formerly director of the planning commission of the City of Denver, and now planning director of the department of development at the University of Denver. The new school is offering five-year degree programs in architecture and planning in the College of Arts and Sciences.

Expanded Program

Cooperating for a second year with the Los Angeles chapter of the A.I.A., University of California Extension this fall is launching an expanded program of engineering and architectural courses, a majority of which will be designed as refresher work for professional men and women.

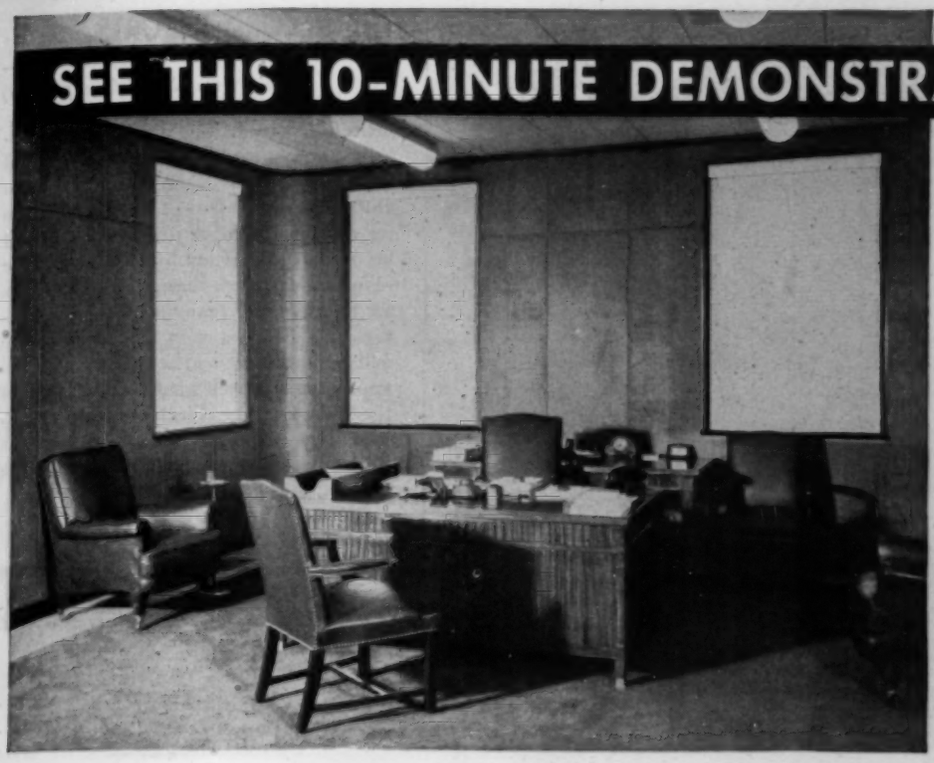
The courses offered will include engineering drawing, materials of engineering construction, analytical mechanics, building codes, construction supervision, and landscape architecture. For the full schedule, address University of California Extension, Los Angeles 24.

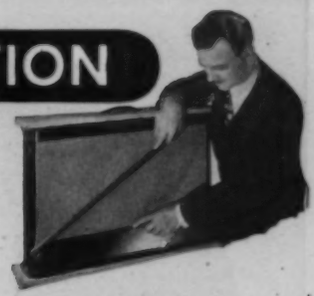
Heating Research

Soon to begin at the University of Illinois, in cooperation with Bituminous Coal Research, Inc., representing the soft coal industry, is a three-year study of planning and design of homes to be

(*Continued on page 20*)

SEE THIS 10-MINUTE DEMONSTRATION





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Boston — Pitcher & Co., Inc.

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This new Sanctuary, with complete decoration, the ecclesiastical beauty of which is apparent in the above reproduction of the artist's preliminary rendition, was designed by Professor Lelio de Ranieri in collaboration with J. M. Mosher, Architect, for St. Cecilia's Church of Pawtucket, R. I., Rev. Mathias A. Hebert. The Altar is finished in a combination of fine imported marbles with Stations of the Cross and Altar appointments executed in bronze with repousse enrichments. A Pulpit of marble, wrought iron and hand-carved oak rounds out an installation which, in every liturgical detail, reflects the high standards of Bernardini craftsmanship.

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THE RECORD REPORTS

(*Continued from page 18*)

heated by coal. The project will consider such subjects as coal storage and handling, ash handling, furnace location and the arrangement of heating facilities for most convenient use of coal. It will involve study of equipment and house plans, and development of suggestions for builders and home owners. The University's Department of Architecture will be in charge of the project and will appoint a research professor to conduct the investigation. Findings will be published by the Small Homes Council at the University, which arranged the project.

New Bulletins

Four new technical bulletins have been issued by the Engineering Experiment Station of the University of Illinois:

1. *Investigation of the Strength of Riveted Joints in Copper Sheets* (No. 360), by W. M. Wilson and A. M. Ozelsel. Results of a series of tests planned to determine the strength of riveted joints against failure, the relation between the load and the slip of the rivets and between the load and the separation of the sheets at the edge of the joint, and the shearing strength of undriven rivets of all diameters.

2. *Residual Stresses in Welded Structures* (No. 361), by Wilbur M. Wilson and Chao-Chien Hao. Includes an analysis of various theories of residual stress, and complete reports on tests to determine the behavior of welded seams under loads, tests to determine the behavior under static loads of plates with circular welded seams, and fatigue tests of plates with longitudinal butt welds.

3. *The Bonding Action of Clays — Part II, Clays in Dry Molding Sands* (No. 362), by Ralph E. Grim and F. Leicester Cuthbert. Includes data showing the relation of dry compression strength to amount of tempering water for various amounts of each type of clay; presents a theory of dry strength based on the wedge-block concept of holding grains in place.

4. *Studies of Slab and Beam Highway Bridges — Part I, Tests of Simple-Span Right I-Beam Bridges* (No. 363), by Nathan M. Newmark, Chester P. Siess, and Robert R. Penman. A report on tests made on 15 I-beam bridges.

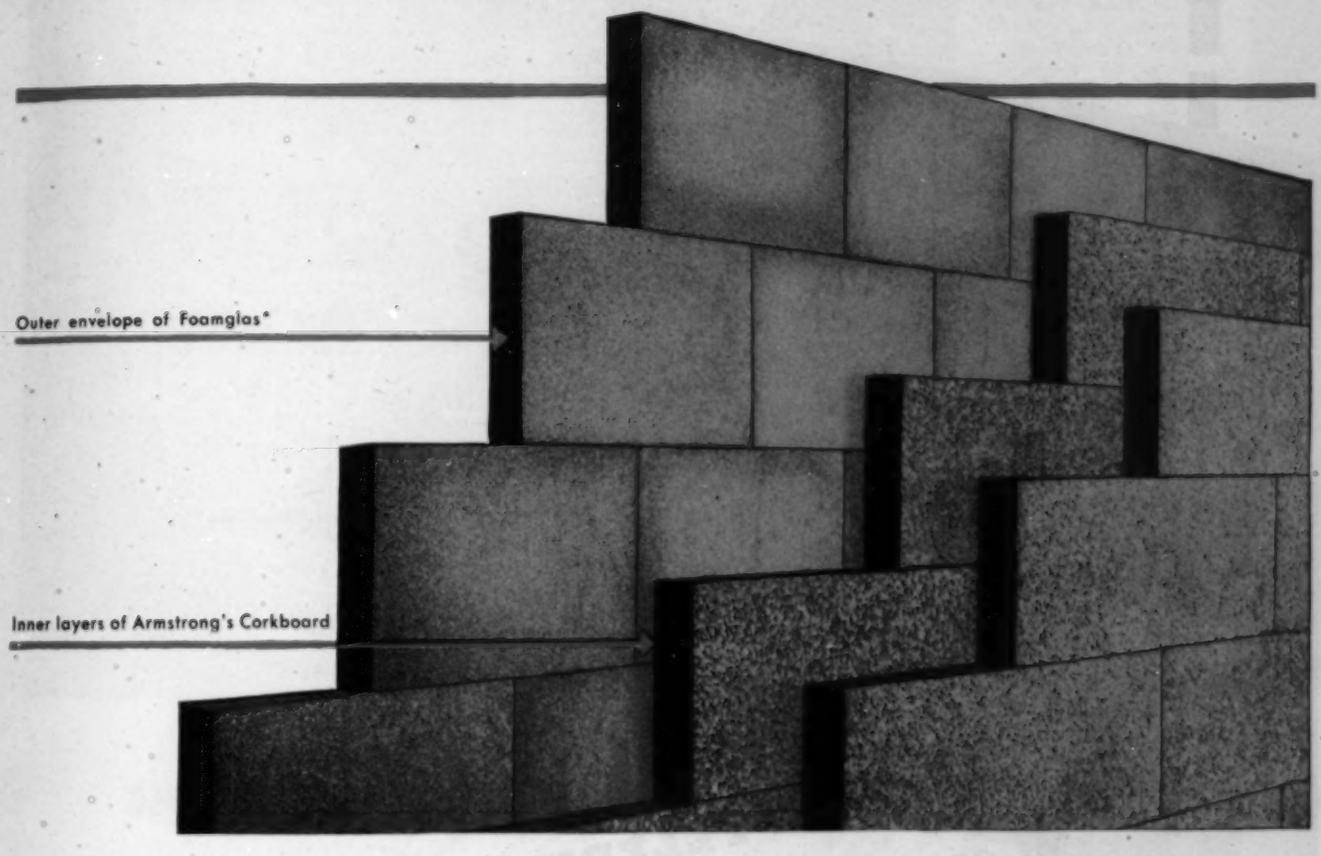
For copies of the four new bulletins, address the Engineering Experiment Station, University of Illinois, Urbana.

Building Started

Construction of the University of Chicago's new $920,000 administration building, the first step in the University's

(*Continued on page 142*)

How to Keep Moisture Out of Cold Room Insulation



REFRIGERATED ROOMS can be insulated so that the walls not only efficiently retard the transmission of heat, but also entirely bar infiltration by moisture.

Keeping out moisture is important. Natural forces are constantly driving moisture into low-temperature insulation. If insulation gets wet, efficiency is greatly reduced. Therefore, a truly moistureproof construction extends the effective life of the installation.

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The Corkboard provides maximum economical insulating efficiency and high natural moisture resistance. The outer shell of Foamglas is not only good insulation, but also provides a positive, permanent vapor seal. Foamglas is the cellular form of glass which is absolutely impervious to moisture, vapor, and air. It is fireproof and structurally strong.

Refrigerated space that must operate under severe conditions—excessive moisture, wide temperature, and high vapor pressure differentials—can use this new combination construction to advantage. For complete details, including engineering drawings and erection specifications, write today to Armstrong Cork Co., Building Materials Div., 2410 Concord St., Lancaster, Pa.

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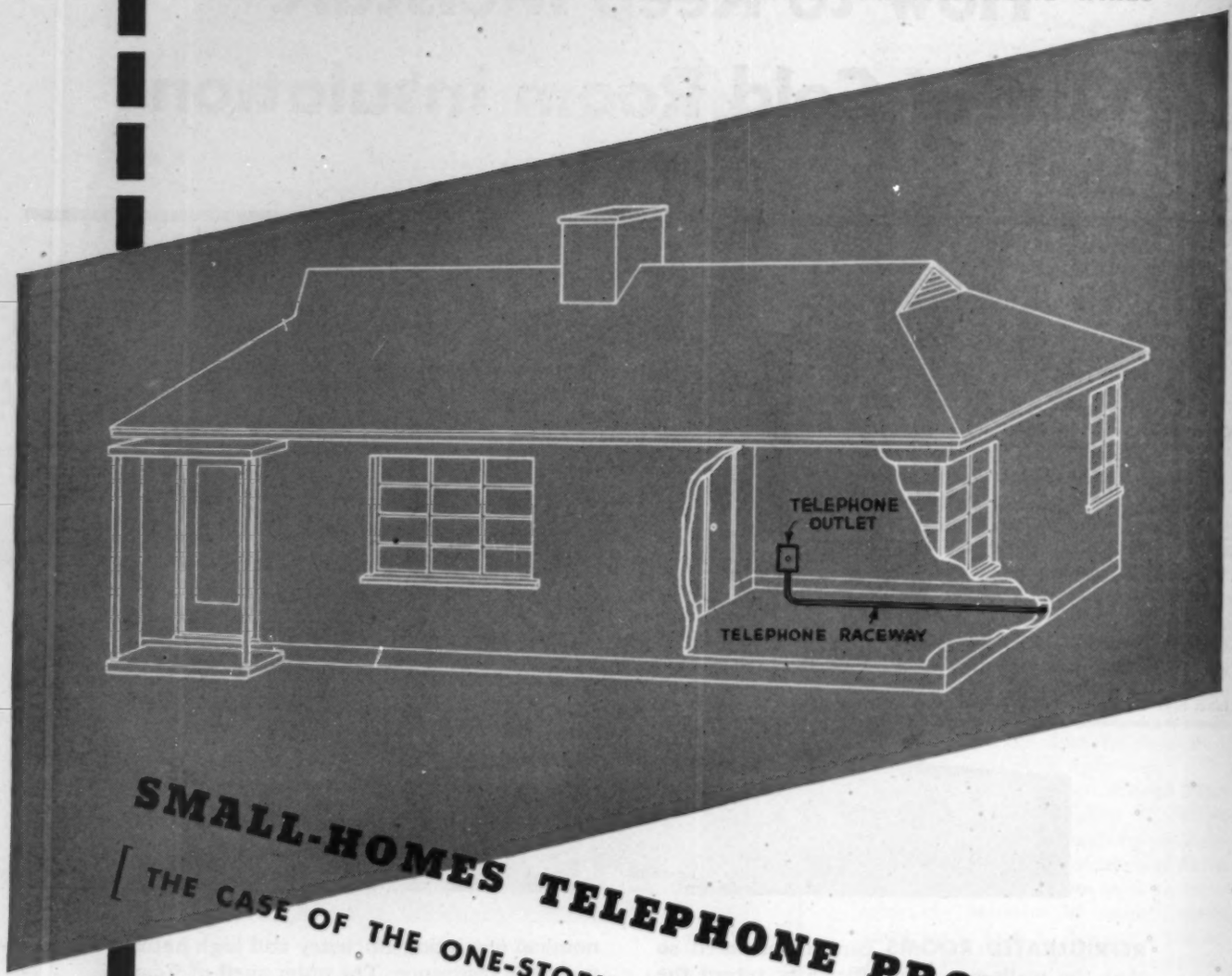

SMALL-HOMES TELEPHONE PROBLEMS

[THE CASE OF THE ONE-STORY HOUSE WITHOUT A BASEMENT]

It is simple and inexpensive to install raceways for telephone wires in the low-cost homes you plan. And home-buyers will appreciate this mark of careful planning.

Telephone raceways are especially important for homes without basements. In these homes the telephone installer generally cannot run wires up through the floor to the telephone location. A simple wiring channel leading to a convenient telephone outlet should be installed before the floor is laid. This will avoid attaching telephone wires in plain sight on baseboards and around windows and door frames.

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Aluminum can be extruded in many shapes to meet individual requirements. This ornamental railing is a typical use for aluminum in this form.

You'll find plenty of places where aluminum tubing can be used to excellent advantage. For example, conduit as shown in this illustration.

Extruded aluminum has many more uses than just for decoration. Here it is saving weight on both skylights and trusses.

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. . . ALWAYS PROVIDE FULL-PATTERN SHOWER

In hotels, clubs, schools, institutions, and in homes and apartments—wherever hot water is a supply problem or a major cost item, the Anystream Shower Head is a real money saver. The figures below show how the Anystream saves up to 58% on hot water consumption.

Water Pressure Pounds	30	40	50	60
Ordinary 4" shower head Gallons per minute	9¼	11½	13½	15
Anystream Self-Cleaning Shower Head				
G.p.m. Normal spray	6¼	7¼	8	9
G.p.m. Needle spray	3¼	5	6¼	6¾

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Anystream Shower Heads are heavily constructed for long wear with low maintenance. Even in areas where alkali and other impurities in the water cause clogging in ordinary showers, the Anystream's self-cleaning feature keeps this head in perfect working condition. All that is required is an occasional turn of the adjustment lever to flood position to flush out foreign matter.

Distributed nationally through plumbing supply dealers and plumbing contractors.

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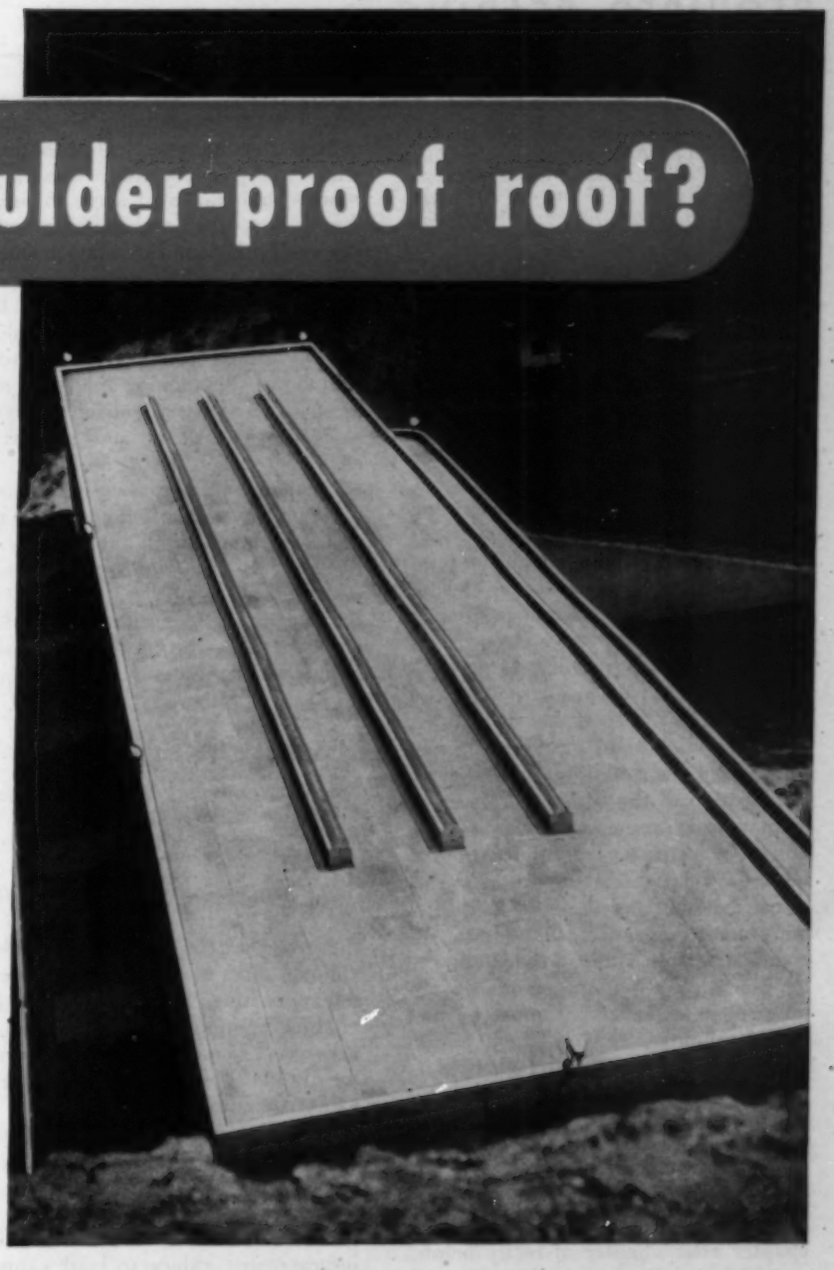

• You're looking at one in this picture of a large Mid-West hydro-electric plant. Located where rocks, boulders and dirt rain down on it from the adjoining cut, this giant plant is safely protected because it has a Ruberoid concrete-surfaced industrial roof.

Obviously, roofs like this will stand the roughest treatment. That's why Ruberoid heavy-duty roofs are opening new architectural possibilities in the use of valuable roof areas for the storage of oil drums, heavy equipment—and even as roof parking areas!

Proved-in-performance specifications—worked out by Ruberoid engineers—are available now for these recent roof developments. Ruberoid Approved Roofing Contractors, located in principal cities and towns are ready to give you assistance in planning and executing them. No matter what type of roof you may have in mind—Asbestos Felt and Asphalt, Coal Tar Pitch and Tarred Felt, or Asphalt Felt and Asphalt—call a Ruberoid Approved roofer. His assistance, based on long experience and backed by a complete line of materials—all from the same source—assures vou of the *right* roof for *any* job.

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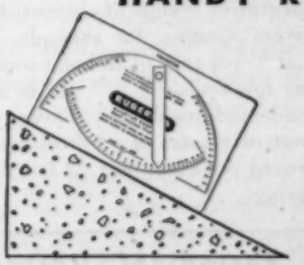

This useful pendulum device instantly gives the roof incline in inches per foot. Helps determine proper type of roof. Made of transparent plastic, it can also be used as a protractor.

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REQUIRED READING

FPHA LOOKS AT HOUSING

Public Housing Design: A Review of Experience in Low-Rent Housing. Washington, D. C., Federal Public Housing Authority, 1946. 7¾ by 10¼ in. viii+294 pp. illus. Supt. of Documents, Washington 25, D. C., $1.25.

Keynoting this review of the FPHA's 10 years of experience in the low-rent housing field is an awareness that each project must be considered as an individual unit and developed carefully in terms of its own specific environment and the families for whom it is intended. "Canned" plans just will not do the trick, the FPHA has found out.

Nor is this the only lesson the housing agency has learned. Slum clearance, says the FPHA, is not the major goal of public housing: "People must be given first consideration; slum clearance though more spectacular, is merely a by-product of housing underprivileged people." The site plan can make or break a project: it is "a complex thing . . . shaped by climate, by local housing customs, economic conditions and laws; by the location of the site with respect to employment, transportation, utilities, and social institutions; by the cost of the land, the relative cost of various forms of construction and the cost of utilities and maintenance; by the habits, incomes and composition of the families to be housed." Minimum standards not only must be met, they must be met with "intimate and sympathetic understanding of the families to be housed."

The FPHA deserves credit for this volume. In the first place it has not shied away from admitting the errors it has made in the past, but actually stresses them for the benefit of future planners. Secondly, it has assembled chapter after chapter of really helpful material, and illustrated it liberally with photographs and plans.

MORE CITY PLANNING

New City Patterns: The Analysis of a Technique for Urban Reintegration. By S. E. Sanders and A. J. Rabuck. New York 18 (330 W. 42nd St.), Reinhold Publishing Corp., 1946. 8½ by 11 in. 198 pp. illus. $7.50.

Numerous diagrams, maps and photos, concise thinking and clarity of expression combine to give this latest book on city planning a reader-interest value rather above the average. The material itself, however, follows the usual pattern: an analysis of what is wrong with present-day cities, what to do about it, and how.

Like most able city planners of the day, Messrs. Sanders and Rabuck, both of whom are connected with federal agencies, stress the importance of planning metropolitan regions in their entirety. All levels of government concerned with the planning of a metropolitan area, they say, must be represented in the agency assigned to the job. Powers and duties of such an agency should be specific, and fully covered by proper legislation. Interstate compacts should be entered into whenever a metropolitan region extends into more than a single state. A master plan should be developed and properly administered. And above all, planning objectives must be sound, and broad enough to stretch well into the years and generations ahead.

Familiar as these planning concepts are, they have been presented here with a new freshness and a new urgency. So, too, with the stress the authors place on parks and greenbelts, traffic control and parking areas, decentralization and facility of transportation. These authors know their subject; their readers should profit by that knowledge.

SOLVENT METROPOLIS

The Self-Supporting City. By Gilbert M. Tucker. New York 21 (50 E. 69th St.), Robert Schalkenbach Foundation, 1946. 5 by 7¾ in. 108 pp. $1.00.

Written in answer to a letter about the cause of city deficits, published in the *New York Herald Tribune*, this small volume offers a plan for making cities self-supporting. The plan is simply this: gradual lightening of the tax on improvements and corresponding increasing of the tax on land until the improvements are entirely tax-free.

This program, Mr. Tucker relates, has been partially tried out in Pennsylvania where, in 1913, the so-called "graded tax law" was passed, providing for a progressive shift of municipal taxes from improvement values to land values in Pittsburgh and Scranton. Results in Pittsburgh are considered good by representative groups of citizens: the Taxpayers' League, for example, "reports that 95 per cent of all home owners now pay lower taxes . . ." and in a typical residential ward, Mr. Tucker reports, "out of a total of 3,272 owners of improved property, only 22 fail to show a saving . . ."

Periodical Literature

APPRAISAL OF NEUTRA

Richard J. Neutra, Architecte: Presentation par Alexandre Persitz. Boulogne (Seine), France (5 rue Bartholdi), L'Architecture D'Aujourd'hui, May-June, 1946, pp. 3–76, illus.

Probably no greater tribute can be paid to an architect than the devotion of an entire issue of an architectural magazine to a presentation of his work. Particularly when it is a presentation as lavish and as detailed as this of Neutra in *L'Architecture D'Aujourd'hui*. The reason for it, M. Persitz explains as follows: "Following a program that we have set for ourselves, we have recently treated in our pages the problems of modern techniques of building. Now it seems necessary to us, in conclusion, to illustrate the real possibilities of these techniques by realizations which have passed the purely experimental stage. The work of Richard J. Neutra is an admirable example for this demonstration. . . . This architect has, in effect, devoted himself for more than 20 years to the systematic study of methods of rational construction."

BRITISH STANDARDS

Britain Bids for Better Building. By W. H. Deacy, Sr. New York (70 E. 45th St.), Industrial Standardization, Aug., 1946, pp. 187–193, illus.

The thorough-going study of building methods undertaken in Great Britain during the past few years under the Ministry of Works is bearing fruit, this article makes clear, in the development of methods of standardization and mass production which the Ministry is now seeking to apply to housing. "Bricks, doors, and windows," Mr. Deacy reports, "are being made in fewer regulated types; the shells of entire houses are being cast in foam slag and aluminum; kitchens, bathrooms, and heating systems are highly standardized."

British experience with standardization indicates that it is of benefit not only to architects, manufacturers of building materials and equipment, and contractors, but to the general public as well. Production has been stepped up, costs have been reduced. It is with reason that Mr. Deacy asks whether a similar program in this country might not have similar good results.

LOBBY COMFORT

How to Heat Lobbies. By T. W. Reynolds. New York 13 (148 Lafayette St.), Heating and Ventilating, Aug., 1946, pp. 69–72, illus.

The familiar and frequently knotty problem of lobby heating is considerably unkinked in this article by Mr. Reynolds. With the aid of diagrams, he explains various solutions that have proved effective. Included is a description of a method involving the use of overhead circular air diffusers connected to ducts run in the hung ceiling from a unit air heater. Another solution is a forced flow convector, which may be concealed or exposed, with top or front supply grille. Such a unit, Mr. Reynolds says, eliminates the difficulty usually experienced in obtaining the necessary and unrestricted flow of return air.

ARCHITECTURAL

RECORD

MORE INSPIRED CHURCHES

WE SHOULD have no illusions about the difficulties of designing a soul-satisfying church. True, it may not be too hard to please a dominie, or his flock, or even the building committee. The pastor may be satisfied if his pulpit is well placed and the acoustics are good; the congregation will probably like the edifice because it is bright-and-shiny new and less draughty than the old; the building committee will like it because they can show that here or there they saved a dollar or two. But to create a church design that is really inspiring, expressive of spiritual aspiration, that lifts one's mind and soul, that creates a worshipful mood — as well as being physically efficient and enduring — is no mean task.

It is a task worthy of the best efforts of the most sensitive and talented members of the profession, one that should be welcomed rather than shunned because of its difficulty. For it does take the highest form of creative imagination — inspiration, if you please. And it takes the utmost of the designers' powers of persuasion, diplomacy, and applied psychology as well. The intrinsic difficulty of the esthetic problem is complicated by the problem of human relationships, the necessity of dealing convincingly with church building committees.

What makes the architect's task the harder is that the church building committee is usually sincere, devoted, well-intentioned and hardworking, however dogmatic, opinionated, parsimonious and "practical" they may turn out to be. Fortunate indeed is the architect who finds a church building committee open-minded, sympathetic, sensitive to the nuances of good design, appreciative of scale, proportion, form, color, texture.

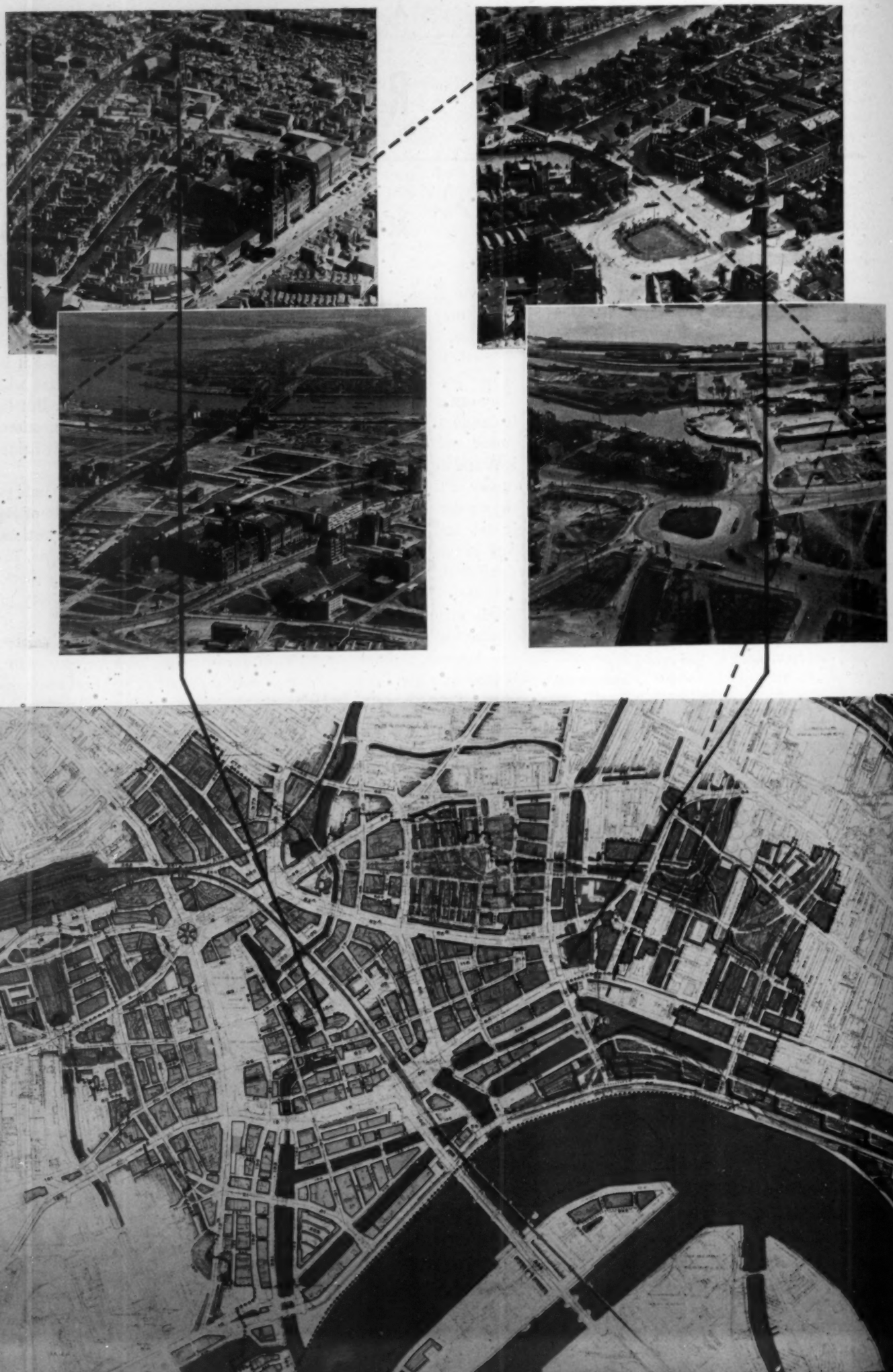
A building committee pre-informed of architectural practice and progress, and predisposed to give the architect the fullest scope for his creative imagination would be a boon conducive to inspired churches. An architectural handbook for the churchman would serve a mighty useful purpose, save many a frustration.

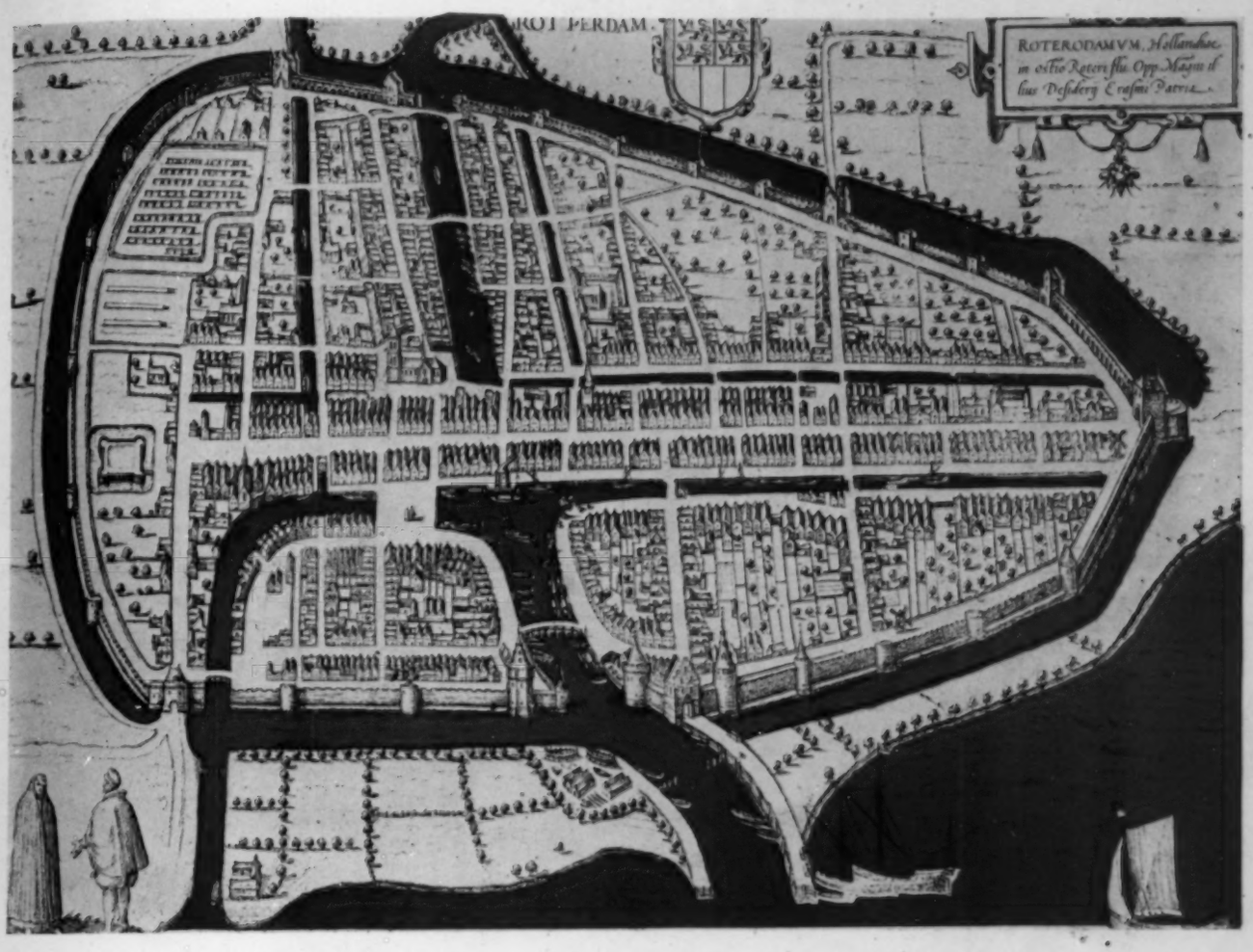
But I do believe that an architect, if he has the will and the inspiration, the patience and the tact, can create, even with a modest budget, a church worthy of its function. However, it seems too few of our most talented designers have devoted their efforts to this most difficult of all forms of architectural expression. Their minds and hands have been otherwise engaged in serving society in more exciting, more lucrative and less circumscribed fields. If our major architectural achievements are in the realm of commerce or industry, recreation or health it is because society's interests, emphasis and emoluments are centered there. For architecture is inevitably an expression of the civilization of the time and place of its creation.

Here and now we find church attendance and church prosperity at new high levels. Hundreds of churches are thus encouraged to wish and to work for new edifices. Architects' plans and sketches are being used as major tools in the fund-raising drives. Today architects are confronted with a greater opportunity for their talents than ever before — the opportunity to design inspired churches, churches as distinguished in the quality of their design as in the quality of their materials and equipment, churches worthy of their functions, spiritual as well as physical.

Kenneth K. Stowell

EDITOR





A PLAN FOR ROTTERDAM

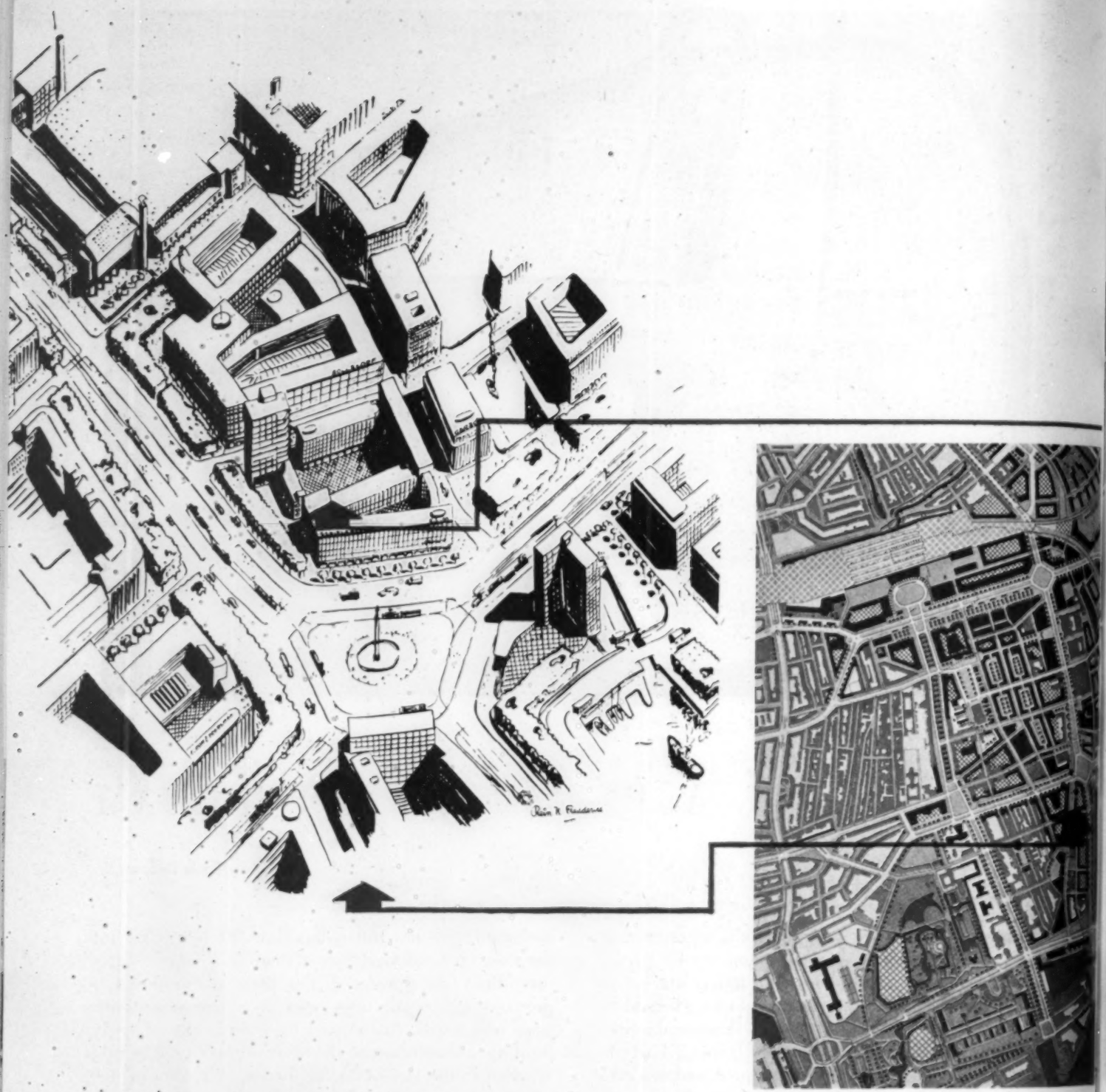
By Earle Draper, Jr.

ROTTERDAM has been working for six years on its new city plan. One of the earlier cities to be largely leveled by bombs, Rotterdam immediately started to replan its future, and, in five years of working behind its conquerors' backs, threshed out the innumerable discussions that must attend drastic replanning. Early in 1946 the new plan was ready and accepted, and new construction was going forward according to its dictates.

Standing in the shadow of the modern Bourse, one of the few buildings spared in the destructive German air raid in May, 1940, one can see the reinforced concrete skeleton of the new Rotterdam Bank Building, and not far west on Coolsingel Street there is a large theater more than half completed. But perhaps the most impressive sight is the large open areas overgrown with grass and weeds. In the past these areas were densely built up and represented the heart of the city. The raid resulted in the loss of 25,000 houses, 2300 shops, 1450 offices, 700 warehouses, 4 railway stations, 24 churches, 60 schools, 500 public houses, 30 factories, and 26 hotels. But there are no ruins left standing to testify to this catastrophe. The industrious Rotterdammers have

---

The first replanning of Rotterdam (opposite page) was completed three weeks after the bombing that virtually leveled the city. The Dutch industriousness that led them to clean up the rubble as thoroughly as is shown in the photographs (even including the removal of old piers and foundations) took on a note approaching panic when it came to the replanning. For the Germans were coming, and the Dutch knew that Hitler dabbled in city planning. So this early plan was rushed in the hope that he might accept it. But the Germans were kept busy, and — fortunately, the Dutch now say — the plan was never put to use. Now it has been superseded by a better one (pages 74–75) prepared during five years of Underground activities



cleared away all of the debris, and have even gone so far as to remove all of the foundation piles.

Reconstruction work will not be confined to the destroyed area; construction projects are going forward in various sections of the city. A large 1900-family housing project is well under way across the Maas River in the southern section of the city; construction of buildings for light industry is in progress northeast of the exchange; canal bridges which will be an integral part of the new street system are in evidence.

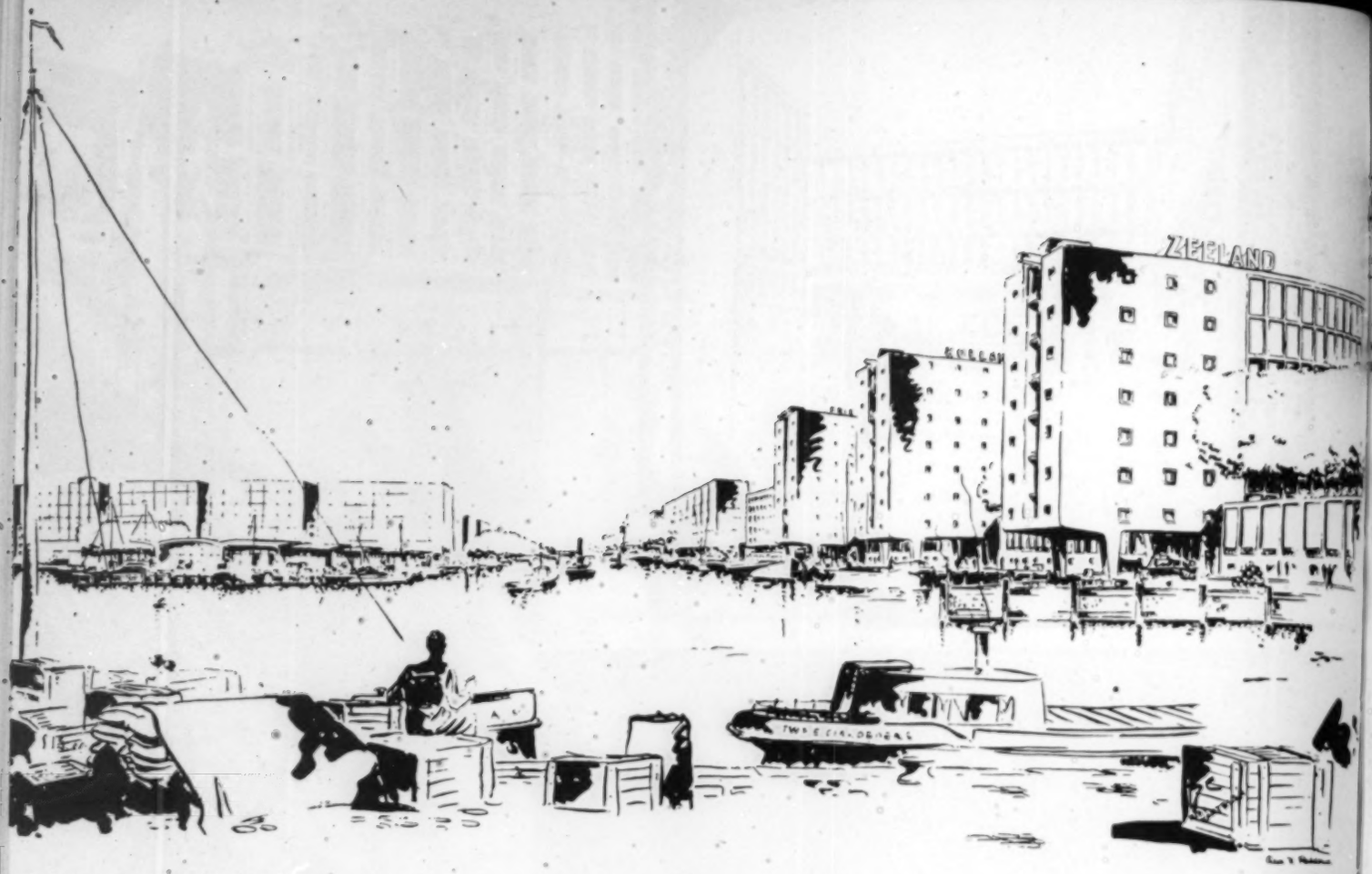
All of these new projects conform with Rotterdam's new plan. This plan represents five years of underground work. It supersedes the first plan for the rebuilding of Rotterdam, which was the official plan for the rebuilding of the city until 1946. This first plan was completed three weeks after the air raid to prevent German interference. As Mr. van Emden put it, "We knew Hitler dabbled in city planning, and we wanted to have a plan ready before he or his technicians arrived." Fortunately the war prevented work on this plan, for had it been

Replanning for Rotterdam began with the dikes and wharfs of the harbor, for shipping is the life blood of the city's commerce. Besides the maritime center and seamen's quarters, there will be other groups segregated by functions — public buildings near the city hall, which was spared in the bombing, a financial group near the Bourse, a recreation center near the central station, housing groups in greenbelt locations, small-industry groups in the city, larger industries outside of the area shown

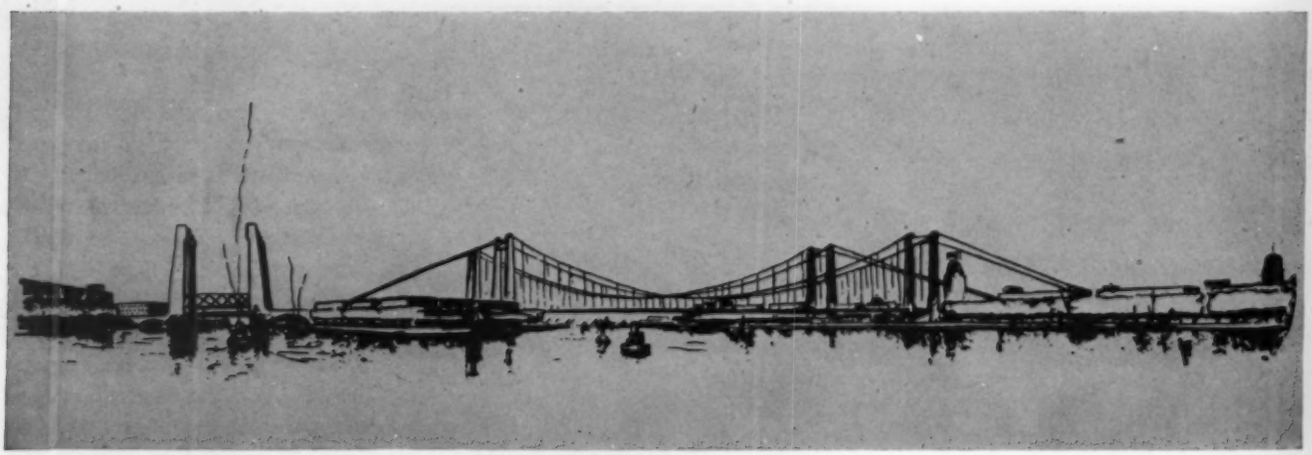
carried out there would have been only a slight improvement on the old city plan.

The new plan of Rotterdam, however, represents a real achievement in city planning. The three men largely responsible for the new plan, Cornelius van Tass, director of planning; Samuel van Emden, deputy director of planning; Rein. H. Fledderus, the chief architect, are to be commended not only for their scheme, but also for the manner in which they arrived at this plan. During the occupation all of the work had to be carried on underground, but in spite of this handicap, the people of Rotterdam were not excluded from the work. Representatives from all walks of life were constantly consulted in the preparation of the plan.

The new plan seeks to achieve an orderly grouping of related functions. Public buildings will be grouped in the vicinity of the city hall, another building spared in the bombing attack; banks will be located near the exchange; a recreation quarter with cafés, restaurants, hotels, and theaters is planned close to the proposed



1 *View 1: the Maritime Center, long piers at the left, wharfs and shippers' buildings at the right*

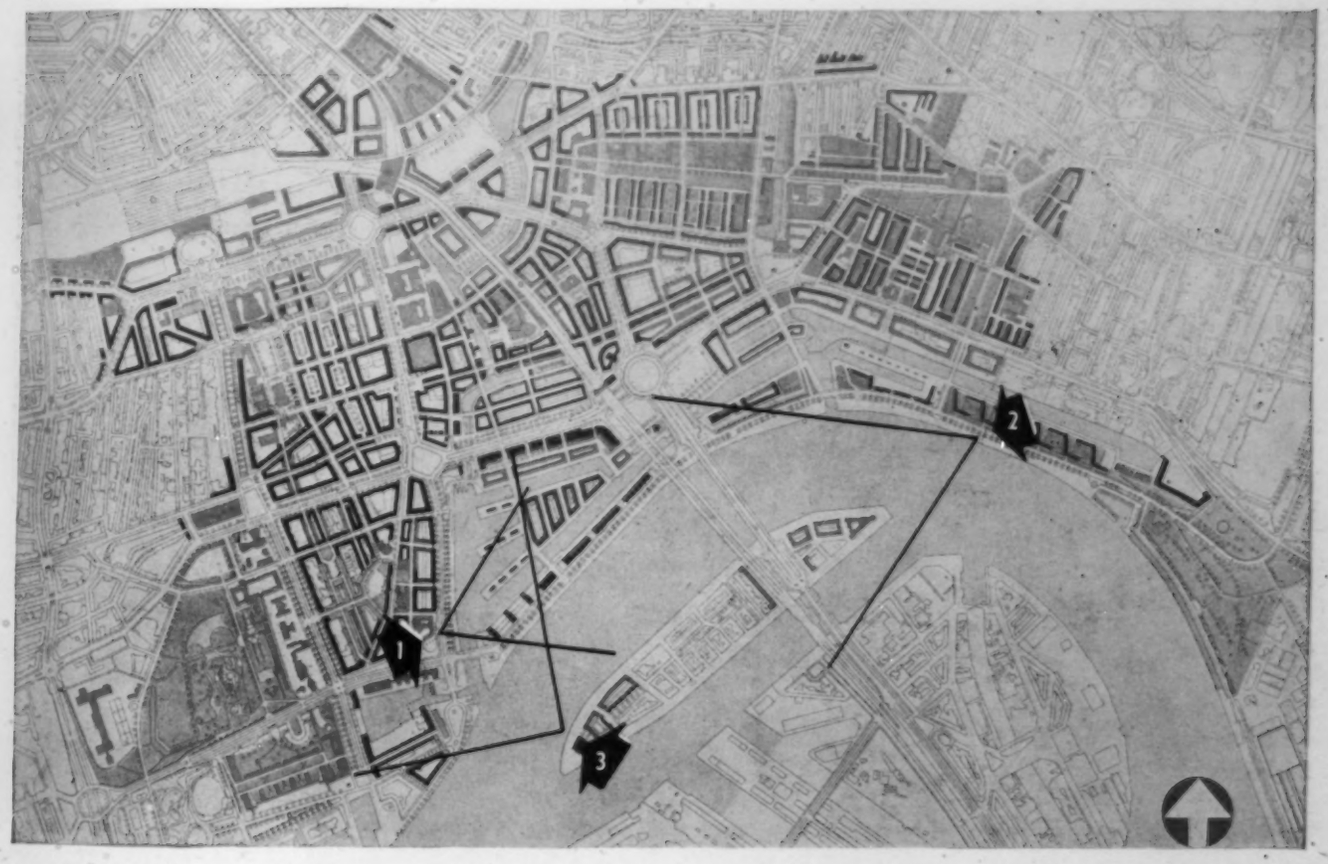


2 *View 2: motor and rail traffic will cross the harbor and the island on two suspension bridges*

central station; a cultural group with concert halls, museums and public meeting halls is projected close to the existing park; a maritime center and seamen's quarters will be constructed in an area close to the waterfront; large industries will be excluded from Rotterdam proper, but small industries will be accommodated in designated areas; and housing, for the most part, will be located in outlying greenbelts.

For traffic circulation, the planners have worked out wide, tree-lined thoroughfares in the heart of the city and a parkway along the waterfront constructed on a new dyke. All trains will arrive at the proposed central station, and the land now occupied by the Maas station will be available for housing. Trains from the south will cross the Maas River over a large suspension bridge and will proceed to the central station over a concrete viaduct. Foot passengers and vehicular traffic will cross the Maas on a suspension bridge also, and this traffic will be received in the new section of the city at a traffic circle located in one of the three large squares projected for the new heart of Rotterdam. Plenty of space is allowed for in planning the circulation scheme, except for

View 3: the western part of the central city as seen from the harbor. Wide tree-lined thoroughfares and canal bridges connect the various centers of the city and provide fast motor access to the docks



the streets in the shopping areas. These streets have been planned for pedestrian traffic only, and, consequently, will be narrow.

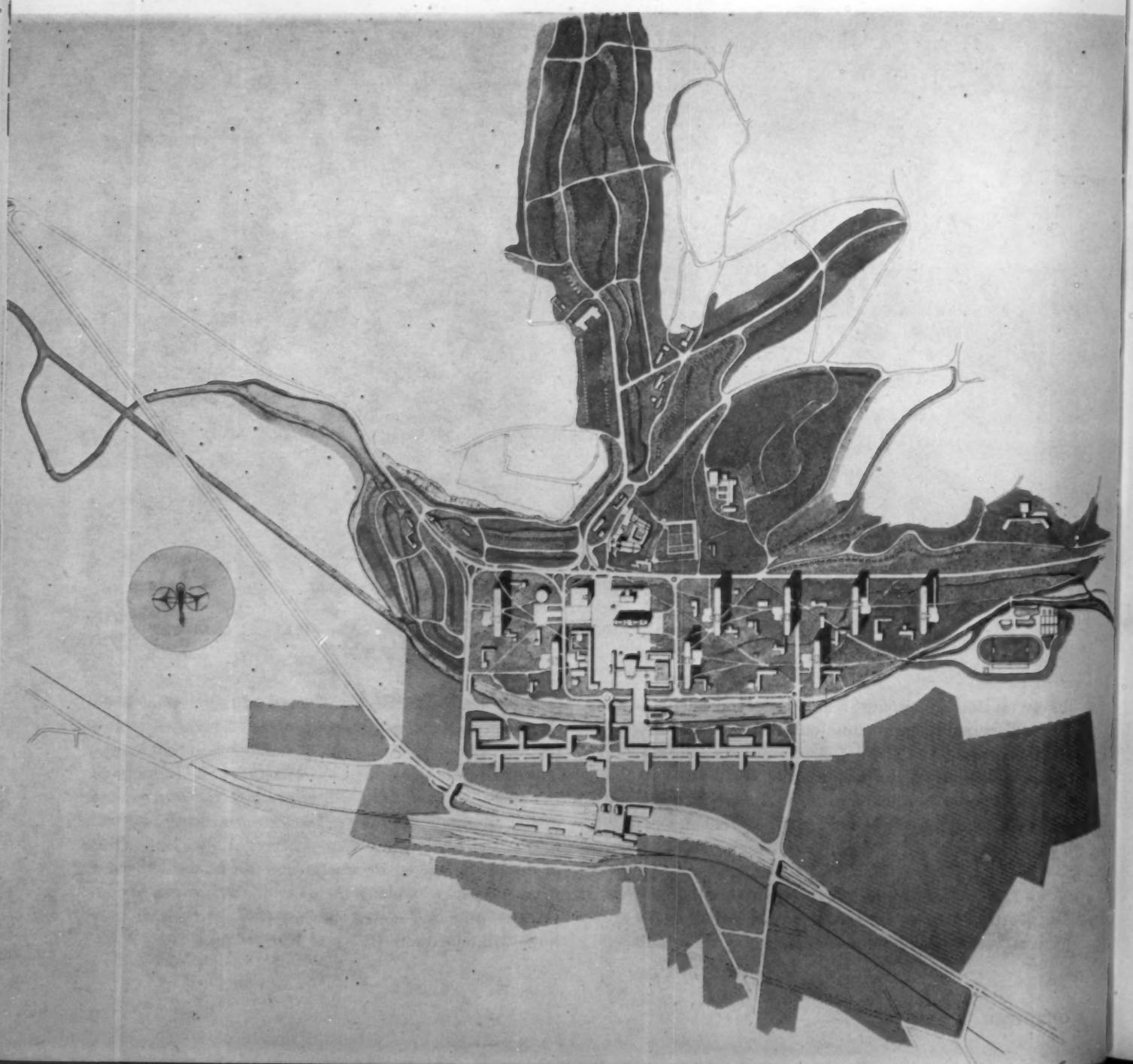
The execution of the new plan of Rotterdam is dependent upon the rejuvenation of the city's principal economic support, shipping. Everyone remembers the bombing attack, but few people outside of Holland are aware of the further damage the Germans were guilty of when they destroyed almost two miles of docks. The Rotterdammers have concentrated their main efforts in reconstruction on the repair of this damage, for they realize the desperate need of the city for a revival of the trade and shipping which flourished before the war. The city planners have made certain that everyone will be conscious of the importance of shipping to the city's economy and will appreciate the importance of the city as a shipping center. In the future one will be able to look down Coolsingel Street and see large ships at dock, and the entire waterfront will be open to view from the parkway along the dyke. Thus have they confidently prepared a welcome for the ships which they hope will once more tie up at Rotterdam.

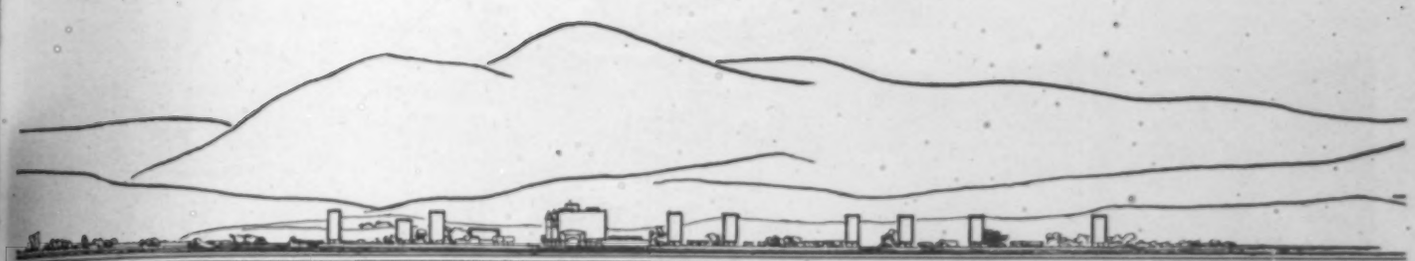
"The present program (10,500 victims) involves four living units and the garden cities radiating about the center of the city. However, the plan reproduced below envisages also several other living units; with these, this part of the city could one day count 20,000 inhabitants. To look for such a growth is nothing but wise foresight in what one calls a master plan.

"A master plan preserves the terrain and must permit execution in steps. At St. Dié the realization of the first can be immediate. It is the beginning of two vertical living units which can be industrially manufactured without delay anywhere in the country, then brought in and erected in place with record speed. And with one stroke the first three thousand residents of St. Dié will be sheltered.

"In the meantime all the other dispositions can be made for the construction of the horizontal garden cities. The factories, also, can be constructed industrially as soon as the program starts.

"It is understood that the buildings that were spared will remain among the new constructions, notably among the manufacturing buildings (to the south of the Meurthe) whose plan here is purely schematic." (Shaded area near highway shows older part of city.)





A PLAN FOR ST. DIE

Le Corbusier

BY LE CORBUSIER

WHEN I was called by the municipality and one of the associations of victims of the city to collaborate as counsellor in the reconstruction of St. Dié, I accepted for diverse reasons, notably the presence in that city of devoted friends of public well-being who are keenly aware of the need for an architecture which takes into consideration the conditions of modern life. Furthermore, St. Dié constitutes in its reurbanization, a living unit made up of a majority of workers in manufacturing industries (printshops, hat factories and spinning mills, etc.). The almost complete destruction of the ancient city had the result of clearing and bringing back into value the surrounding countryside, which is agreeable and charming. It is a revelation for the visitor and still more for the resident. This is a treasure regained, which it would be criminal to allow a lazy and inattentive urbanization to bury again at the bottom of courtyards or behind the walls of corridor streets.

The master plan must bring a solace to the labor of the workers, and especially to that of the women, housewives, who in modern life are crushed under the burden of domestic duties. Architecture and modern urbanism have the possibility of giving to domestic labor a greater efficacy with less effort. And the dispositions which may be made will lead to ways of life beneficial to the future. I am thinking here of a method of existence, a method of daily life which will free it from the lethargy which betrayed it and will continue to betray it if we are not careful. I am thinking also of the evils resulting from the industrial evolution — tentaculate cities and deserted fields — which we must try to remedy.

This was the problem for St. Dié:

Destroyed zone: A rectangle cleared by shell and fire, which was the very cradle of the city, the place where it was born and started to raise itself. Approximately 10,500 victims who are tenants and small property owners.

The project envisages the possible distribution of: 6,000 residents in buildings furnished with "communal services" and with "extensions of the dwelling"; that is the type of vertical garden city (four living units). 4,000 residents in individual family houses, of the horizontal garden city type. The proportion may be equally well 5,000 and 5,000 or 4,000 and 6,000.

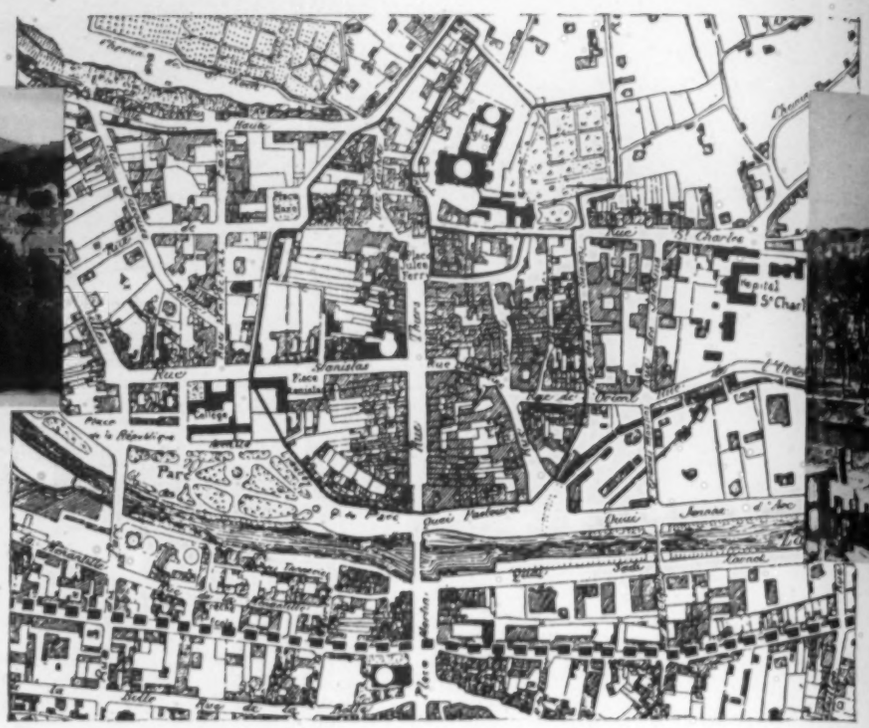
We belong to a civilization characterized by a considerable development of large-scale industrial production. Work is an essential part of our daily life. The plan reintroduces it into the city as the integrating part of an urban life to which one tries to give dignity, a reason for being and strength.

The factories are grouped and combine all the technical facilities for a modern operation. They will constitute one of the aspects of the city scene, one of the essential parts of the urban activity.

This group of factories, on the left bank of the Meurthe, occupies a territory covered with ruins. Naturally, the few buildings which escaped the disaster will be respected. The present master plan, in the form in which it is here published, is purely schematic.

The homes, provided with their "communal services" and their "prolongations," occupy the same terrain as the ancient city. Four living units accommodate about 6,000 persons. Fifty meters high, at the most, they mark themselves off against an immense space today liberated of all barriers. From each residence the view will be magnificent, on the higher floors even more than on the lower. (The plan is arranged for an eventual extension to eight living units.)

The living units offer the advantage over every other method of construction in that they permit an immediate commencement and take advantage of all the re-



Before it was razed by bombs, St. Dié was a typical French town, with rows of buildings packed together on streets laid out for an age of carts and pedestrians. But now "the misfortunes of war have left the soil free. Anything is permissible. Everything can be and must be planned."

sources of manufacture in series and all the quality of standardization. Better yet, in a region ravaged as St. Dié, they can be made industrial accomplishments (industry takes over construction), thus leading the world of production to eminently productive tasks.

The building industry has suffered so much since 1930 that it is not in condition to face the present tasks which are crushing. If industry takes over construction, or at least a part of the tasks, it is in effect the providential application of technique in a dramatic conjunction. But on another plan, the living unit offers the immense interest of lending itself economically and efficaciously to the installation of equipment for the preparation of food and for domestic service according to the formulas which bring to the housewife such relief as one would never suspect. We think also of the services of preventive and curative medicine; of dispensaries and emergency hospitals; of physical culture becoming then a regular function of the daily life; of heliotherapy and of hydrotherapy scientifically practiced.

Outside the buildings, and on the extensive level spaces which surround them, there are the prolongations of the home, to wit: the nurseries and the kindergartens, primary schools, the workshops or the clubs for adolescents, finally, the sports fields at the base of the home: races, tennis, basketball, football, swimming in the open air.

The surrounding free spaces may have yet other installations: In particular, well-organized vegetable gardens with common cultivation and automatic irrigation offered to those who want to cultivate their own gardens.

The second lot of homes will be made up of family dwellings having gardens, some large, some small.

Certain of these houses destined for a clientele of means may be constructed by private initiative. Others for the use of more modest occupants may be planned in groups to gain the benefits of effective and economical series production.

The vertical garden city and the horizontal garden city can co-exist perfectly in harmonious relations. The experiment may bear fruit and the users will pronounce themselves one day in favor of one or the other formula.

Finally, in the center of the presently ruined territory of the city of St. Dié, there is a spot specially selected for the construction of the civic center.

The civic center is forbidden ground to automobiles; it is reserved for pedestrians. It groups in a single perspective the buildings of work, public and private administration and the cathedral. It includes as well the artisans' shops and the tourist center, the cafés with their terraces and their gardens, the amusement halls (cinemas, etc.), whatever one can call the department stores that have available space sufficient for the parking of vehicles belonging to the clientele from the country, finally the transient hotel and the hotel for tourists. The civic center is the pre-eminent place of the city, its heart and its brain. It is there that through monuments and through activities the city life develops and writes itself in history.

The primary schools form part of the living units (vertical or horizontal garden cities). The higher school could be built on the hill to the east of the cathedral, the hospital still further to the east. The fields for spectator sports would be installed on the plain to the east.

The Meurthe flows at the bottom of a cut 75 meters wide and with banks 4 or 5 meters high.

By means of a summer dam, it would be possible to obtain in season a magnificent expanse of water which would unite the cities of work, the civic center and the centers of habitation, and which would permit the healthy and attractive practice of water games.

"The bishop of St. Dié said to me, 'Have you noticed that the countryside has appeared since the city was razed — an admirable and consoling landscape. What a miracle if one could preserve it in reconstructing the city!' Up to the present the remarkable landscape of hills and mountains that surround St. Dié was banished from the city as from the houses. The new project permits integrating it in all its splendor in the civic life as in the life of each individual — a daily stimulant."

"CROSSING THE THRESHOLD"

By Claudius Petit, Vice-president, Commission for Reconstruction and City Planning, L'Assemblée Nationale Constituante

For St. Dié, as for other cities, the great question is posed: "Shall we recommence the past? Shall we foretell the future by being of our time?"

The war left everywhere its train of ruin and misfortune. The ravaged cities, the mutilated houses, the overturned soil of our fields are all too numerous witnesses of this. Circumstances sometimes accentuate these destructions and make them symbolic.

St. Dié, where for the first time America received its name; where the Americans in the first war of liberty mounted their lines; St. Dié, goddaughter of America and dear to the hearts of American legionnaires, had to undergo the sadism of the barbarians.

Pitilessly, during a succession of days, each house was dynamited and burned. Nothing was spared; methodically, calmly, without any strategic military reason, the enemy satiated his vengeance. Everything that had a distinctive character, everything that constituted the civic center and contained the historic souvenirs has been reduced to a jumbled pile of stones. Only a few arcades of rose-colored sandstone attest a prosperous epoch. But, strangely, at the corner of a street a block of wall remained upright, bearing a plaque whereon is simply related the double sponsorship of America and of St. Dié. In spite of the barbarian, even the material testimony of this memory has not been effaced.

The past? Like many small cities grown up by hazard, without a master plan, in a banal diversity, St. Dié spread out its houses along streets with no special character. The admirable landscape of hills was invisible behind the walls and the closely set houses. There, as elsewhere, chance had brought disorder.

The misfortunes of war have left the soil free. Anything is permissible. Everything can be and must be planned.

While Athens flamed, the Greeks won the battle of Salamis, and on the ruins of Athens they constructed the eternal Athens of the Acropolis and of the Parthenon. When the great fire destroyed Rennes at the beginning of the 18th century, it was rebuilt in the style of the period, for it is always true that man is capable of making a greater good come out of what seems an irreparable misfortune.

To pass from the city as we know it; formed of houses wed to the meanders of the streets, heaped up according to caprice, the fortunes and misfortunes of successive proprietors of the ground and buildings, and often shut off from the sun; to pass from the city, wayward child of the Middle Ages and of the Renaissance, where everything is measured by the pace of man and of the horse, the city astonished by every new growth, pounded and polluted by a devouring industrialism; to pass from this to the city of our time is not easy. It requires much audacity, perseverance; patience and convincing faith.

People do not like to change their habits. Often they have their ideas completely fixed. Understanding badly

WORKING IN URBANISM AND ARCHITECTURE

A note to

THE tasks of urbanism and architecture which present themselves to authorities and to professionals seem to suggest modifications and innovations in the customs of practice in architects' offices. Truly the problems have become very complex.

In my opinion urbanism can exist only in three dimensions. That is the fundamental reform.

Urbanism is not really a question of road networks or of abstract regulations. It has for its mission to conceive the form, volume and size of the vessels necessary to contain the diverse functions that constitute the life of society: the dwellings, the places for work, the places for cultivation of body and spirit. These functions must be housed in "conditions of nature," which is to say that above all they must take into account the imperative law of the sun. The sun is the foremost consideration.

The vessels to contain these three cardinal elements are in reality living organisms; place them in contact and one has the phenomenon of circulation, a complementary element. The urbanist is a sociologist, at the same time that he is a humanist, also a technician.

One man alone cannot be administrator, engineer and architect, in the detail and exactitude required. But these three sorts of individuals must work together, must form an integrated unit.

Therefore I was called upon to create the first combination of such talents, the ATBAT, Atelier of Builders. We are building socially as well as technically and artistically. Building is setting up of scaffolding, orchestrating, arranging; it is harmonizing everything. Our workshop of builders is, then, a cooperative which groups people belonging to the

the nature of the problems, they give definitive opinions which nothing can shake. It also happens that those who could and should enlighten them guard themselves from doing so, and prefer to follow the ill-informed in their error, rather than risk the opposition of the officials or of the electorate by showing them the healthy road to follow.

And yet! Who does not see in a plan as clear as that of Le Corbusier the happy synthesis of an industrious city, spacious, airy, open to the sun and to nature, having crossed the threshold? Man has here become once more a free pedestrian, relieved of the autos which are put in their place on their ways. Here quietude returns to the heart of the woman watching her children.

The man and the woman are workers. They are workers who, when day is ended, live in quarters handsomer than any dream. Everything is harmony. The volumes compose themselves in the sky. The civic center is ordered on the scale of the little city of workers. It is the normal meeting place near the shops, the cinemas, the clubs, for the youth and the active part of the population. A judicious proportion of individual houses is planned, permitting a comparison between the two propositions: vertical garden cities and horizontal garden cities. Here, contrary to all the slogans in vogue, one does not exclude the other. Perhaps it may even be that the horizontal is only possible in combination with the vertical. But it is permitted to think that the latter gives greater comfort, and, with the prolongations of the home and the services of these buildings, more liberty, particularly to the woman, mother of a family.

Municipal officeholders, if they wish to be good administrators, must be attentive to this aspect of the problem which is too often forgotten: the price of maintenance and use of a city which is all low and of another which is all high. With equal comfort and equal rate of return, it must be possible to make some choice, and possibly a point of equilibrium can be established where everyone will pay according to the expense he imposes on the community. The roads are expensive, likewise the sidewalks, the sewers, piping of all sorts, as well as the steps of the postman!

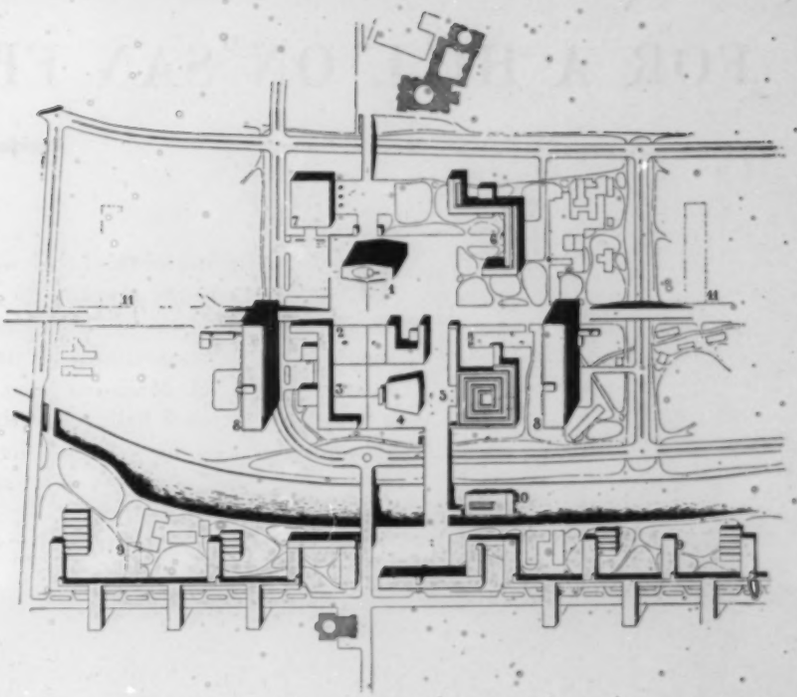
Who does not see the solid bonds that tie this project to the great accomplishments of ancient times? It is in the tradition of the great builders — that of the Roman cities, of the cathedrals and of the chateaux, of the royal squares that have so profoundly marked the French cities. The tourists from all corners of France, from all parts of the world, after having seen the Place de la Concorde, the Place Vendome, the Place Stanislas, would go to see St.-Dié-the-New, who will be proud to be the first in the world, before all her big sisters who try by patchwork to adapt themselves to the present-day necessities, to cross the threshold, to be of her time. She would be sure of herself, industrious little city, strong in the health and joy of her workers, for whom she made herself beautiful and pleasant.

It is necessary that we be able to cease to speak in the conditional. This plan, so beautiful in its simplicity, must become reality. Certainly, it can be retouched, reformed, adjusted. This is only the first draught. But if the master idea remains, St. Dié, the godmother of America, St. Dié, the goddaughter of America, St. Dié, the martyr, the useless victim of barbarity, can become the symbol of the rebirth of our country and of the coming of the new times.

What greater sign of confidence in the future of the country could one seek than that a little city entirely devoted to work, marked by destiny, should be the first to cross the threshold?

Will the timid and the fearful permit the reasonable to work? Only the bold are reasonable.

three callings mentioned above, of diverse ages and experience. Such is the organization conceived to respond to the tasks of architecture and urbanism.



ST. DIE, "GODMOTHER OF AMERICA"

Bombs and fires respect a plaque commemorating the naming of America

In 1507, there existed at St. Dié a small group of humanists composed in large part of members of the Chauvinist Chapter, and whom the Duke of Lorraine, Rene II, himself imbued with the sciences and geography, patronized. This little group which called itself the Gymnasium of the Vosges, had adopted the idea of popularizing the scientific knowledge of the epoch, and the first step toward the realization of this project had been the creation of a printing establishment. The sponsor of the printing shop was the Duke's chaplain and secretary, Vautrin Lud, and the two directors were Martin Waldseemuller and Mathias Ringmann. To inaugurate their project they decided to re-edit the cosmography of Ptolemy and to publish a planisphere and a world map which would be the materialization of the work.

Now, at the moment when the work was under way, and while Ringmann was editing a little work which was to serve as preface to the book, the Duke of Lorraine received a copy of the account of the four voyages of Amerigo Vespucci in the new world. He passed the book to his chaplain, who in turn showed it to the printers. These men were ignorant of the name of Christopher Columbus, whose voyages, for mercantile reasons, had carefully been kept secret by the Spanish rulers, became excited about the accounts, and Ringmann put in his "Cosmography" the following text:

"Now, since these parts (of the world) have been thoroughly explored, and a fourth part has been discovered by Americus Vespucius, I see nothing that could prevent, after the discovery by this Americus, a wise and ingenious man, that it be called Amerige, or land of Americus, or America, inasmuch as Europe and Asia both have been given feminine names."

Waldseemuller, for his part, engraved on his map the name America on the location of the new continent. Thus, for the first time the name of America was printed at St. Dié on April 25, 1507.

It is even possible to go further back in history. In 1410, Pierre d'Ailly, Grand Prevost of St. Dié, in his book entitled "The Image of the World" asserted the thesis, that unknown lands must exist, and that they would be discovered by going westward from Europe. It was reading this book that incited Christopher Columbus to undertake his voyage.

In 1911, a commemorative plaque was placed on the house that had replaced the printing shop of the Gymnasium Vosgien. Celebrations took place the 15th and 16th of July, in the presence of the American Ambassador, Mr. Robert Bacon. He was given portraits of Vautrin Lud, Ringmann and Waldseemuller to be transmitted to his government. In an eloquent speech Mr. Bacon associated with these celebrations the memory of the independence of the United States.

In 1921 the American Legion paid a visit to St. Dié, and a commemorative celebration took place at that time, during which a second plaque was placed below the first.

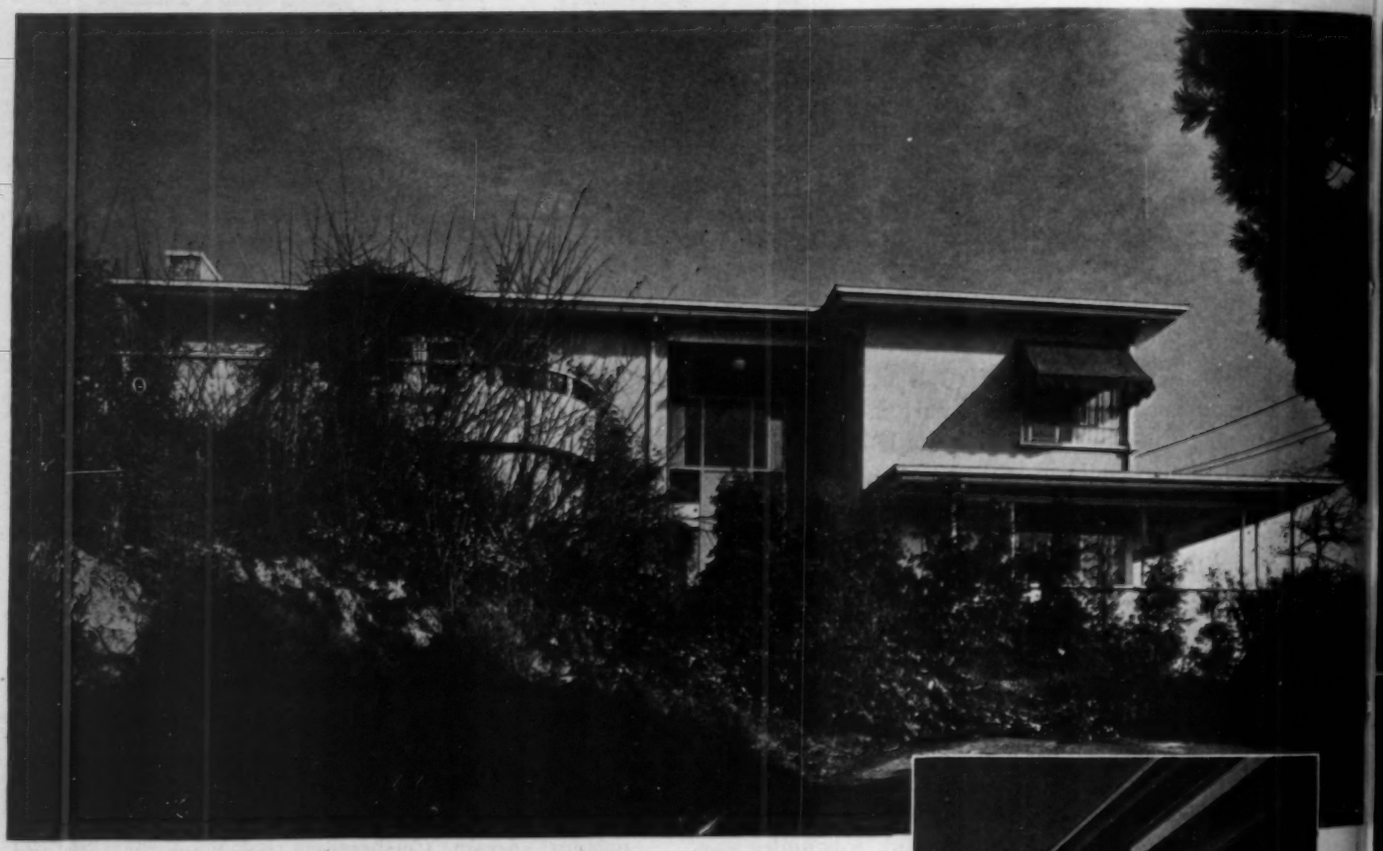
The house to which these plaques were attached was burned during the fire of St. Dié, in November 1944, but the fire respected the plaques, and the portion of the wall to which they are attached will be preserved, bearing witness to the memory attached to that spot, and to the barbarity of those who tried to destroy it.

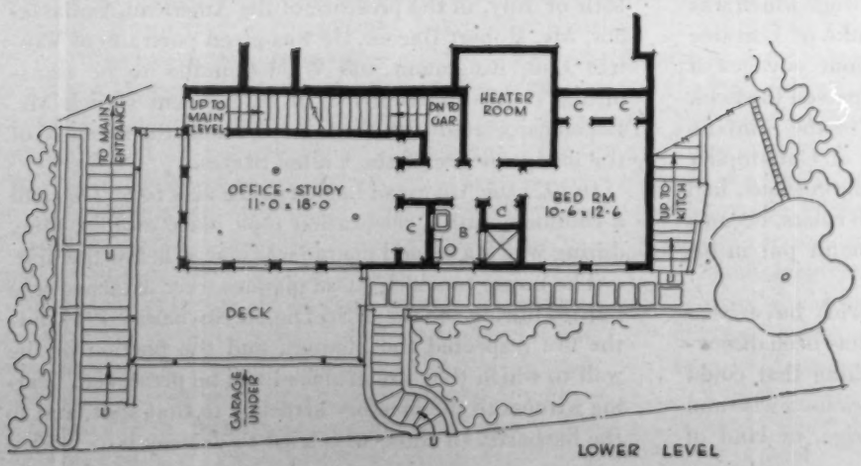
FOR A HILL ON SAN FRANCISCO BAY

Residence for Mrs. Marjerie Myers, Piedmont, Cal.

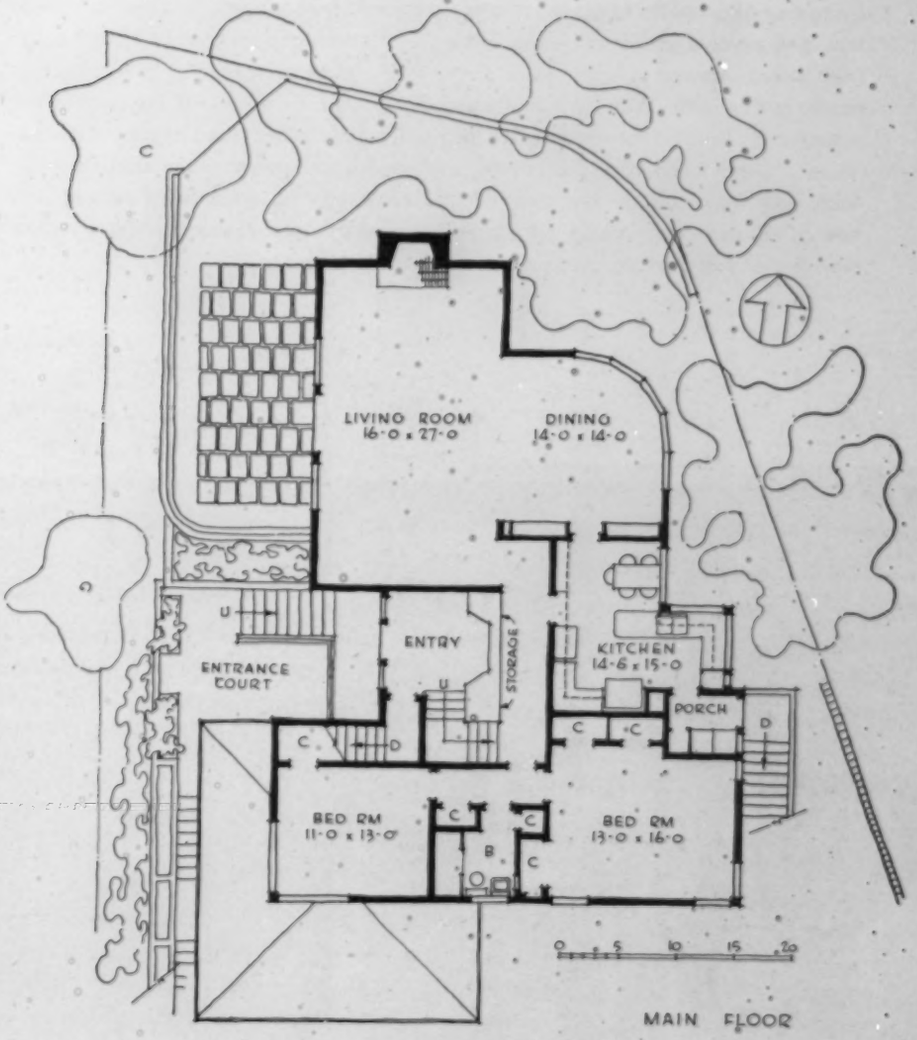
Michael Goodman, Architect

DESIGN problems for this house were largely matters of site limitations: the lot slopes steeply up from the sidewalk, and was also restricted in size. Hence the garage was dug into the bank, more than two stories below the main floor, and connected to it through a residential office then up to an intermediate level. Main entrance is reached by outside stairs, leading to a two-story entrance hall. All of the climbing involved now begins to have its compensations, for combined living room and dining room offer magnificent views of San Francisco Bay, and, in the foreground, a rear garden.

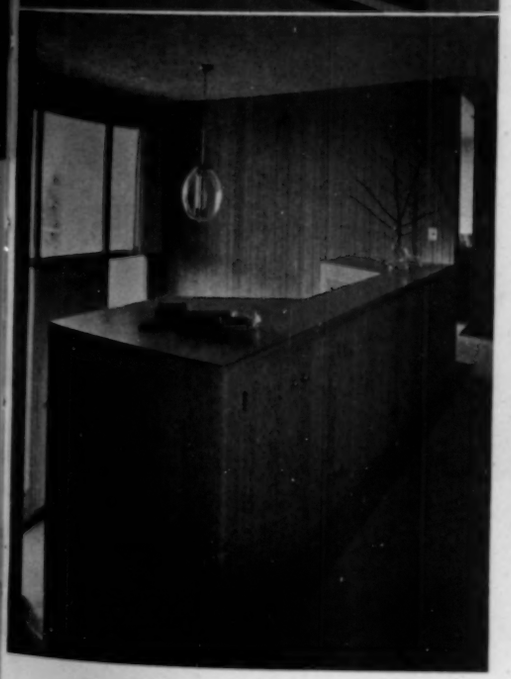


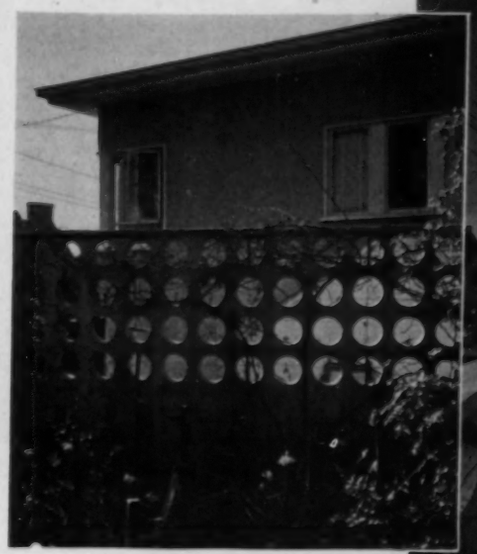


Two-story entrance hall (two views below) provides two coat closets on the lower level and storage cabinets above. On its upper level it also serves as corridor between living room and bedrooms. Concrete enclosing walls (lower right) are built on post hole foundations to prevent settling and displacement on hillside locations

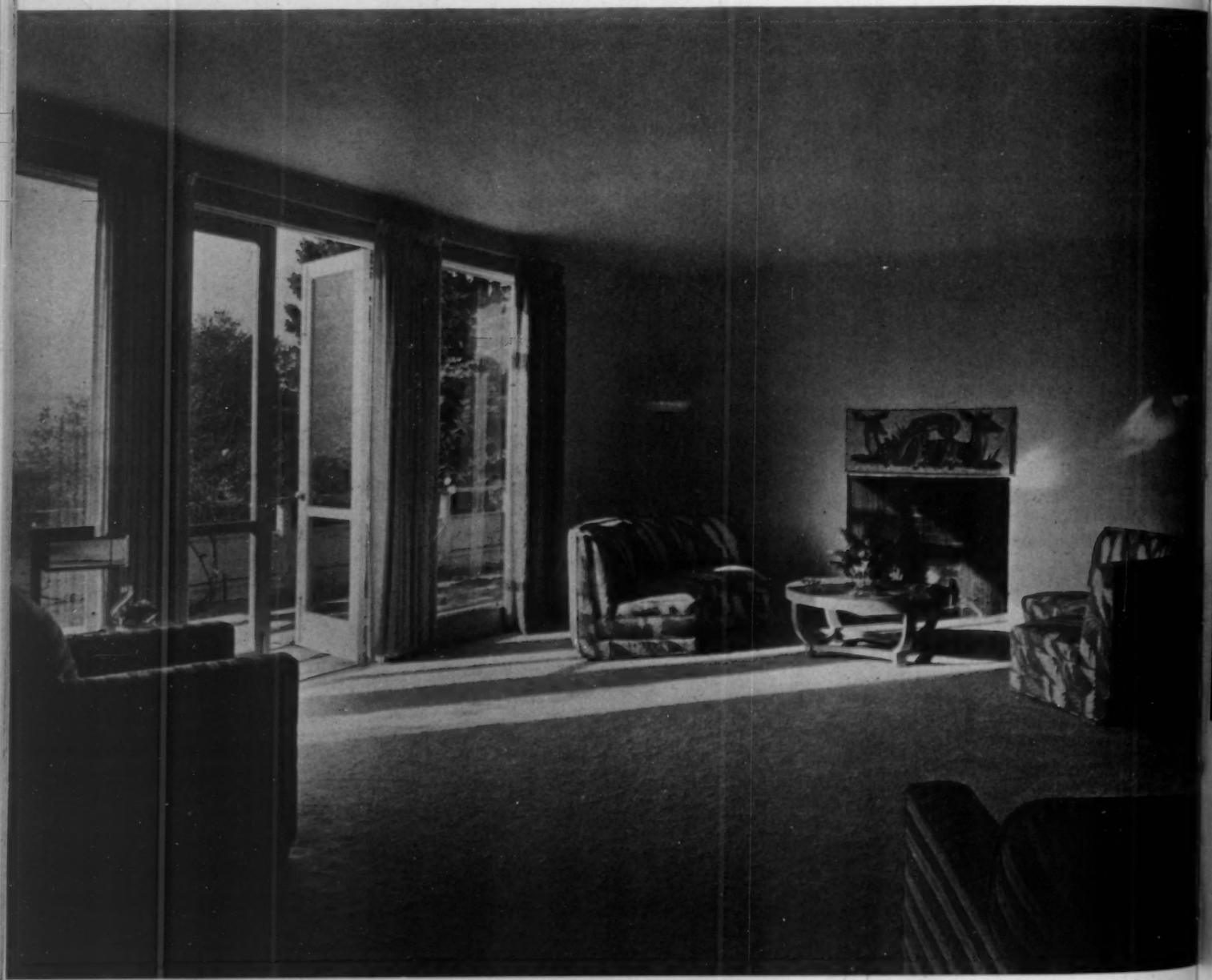


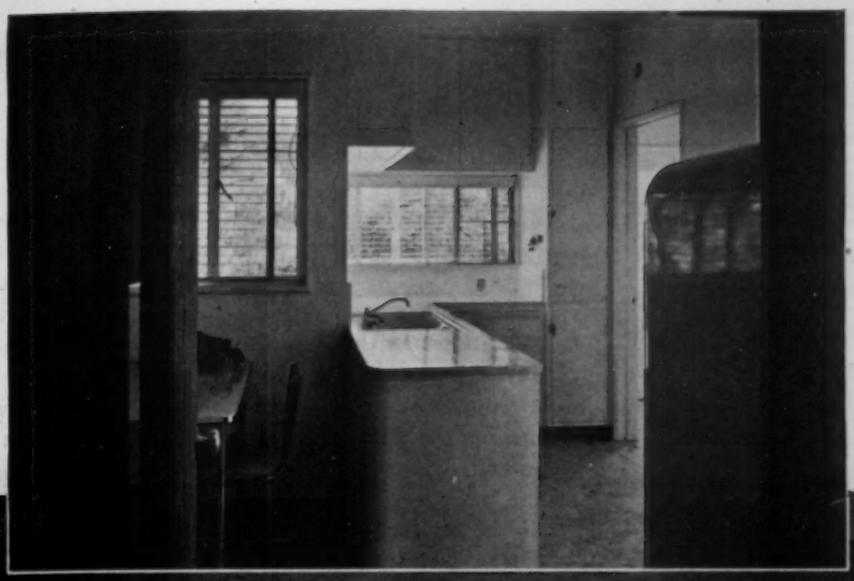
MAIN FLOOR

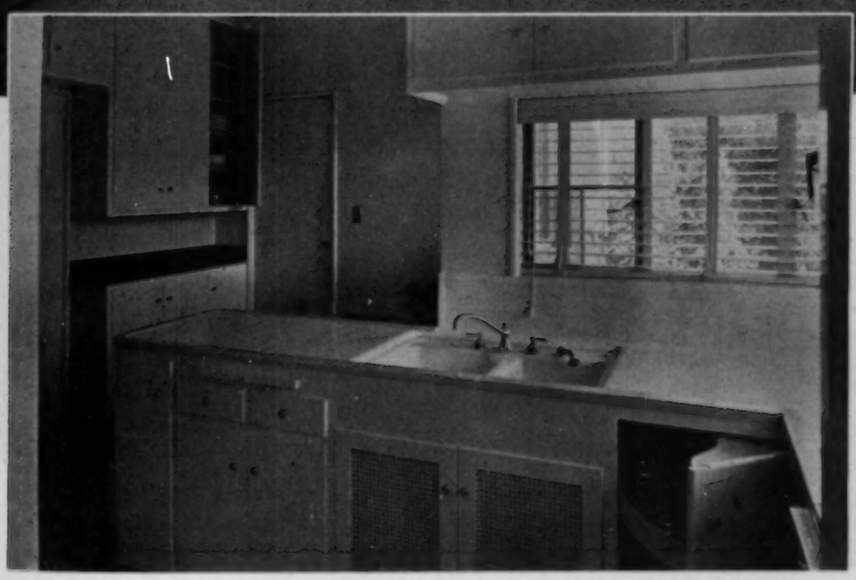


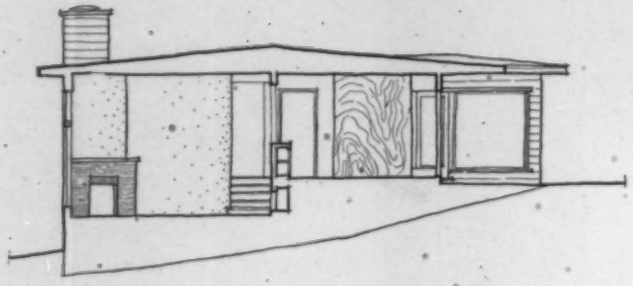


Living room doors of the Myers house open onto a high terrace overlooking San Francisco Bay, with enclosed garden at the rear of the site. Interior walls are finished in white sand finish stucco, painted in light colors. The over-mantel decoration is a colored pebble mosaic by Puccinelli. Walls and cabinets in dining room are done in D'Oro plywood in natural straw finish. In the entrance hall the walls are of combed wood in gray stain. The house is built of wood frame construction, with composition roof, gray-pink stucco exterior finish, with woodwork painted cream. In the kitchen a long tile-surfaced cabinet sink extends out as a low partition cutting off the breakfast area. Generous high windows provide plenty of daylight, also supervisory view of play patio





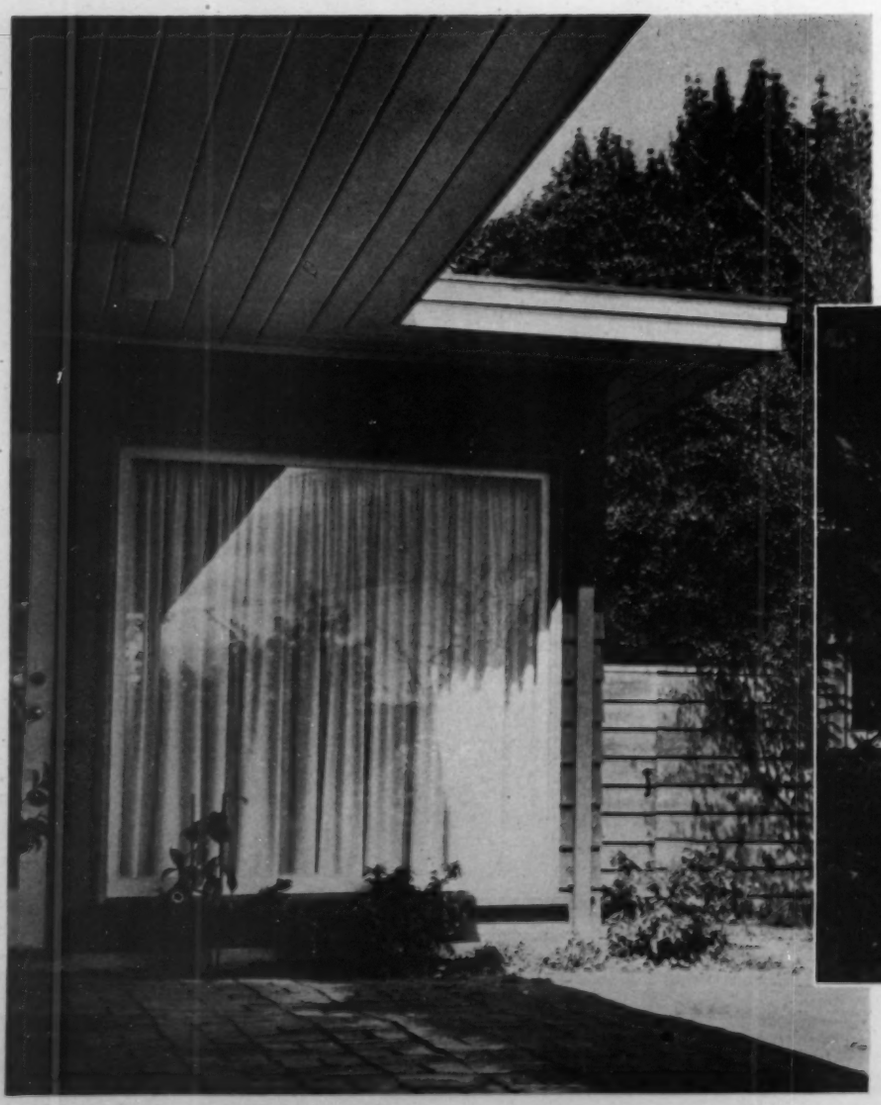


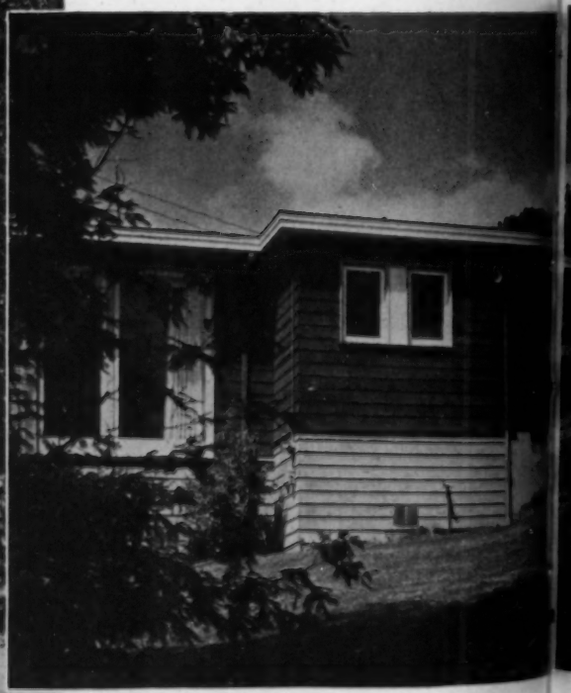


TWO-LEVEL SCHEME

EVERY California house has a view, and architects are forever developing new wrinkles of levels, terraces, vista devices to capitalize on hillside plots that look down valleys or valley sites that look upward toward mountains. In this case the view is downward, and the device is new only in use. It is what is sometimes called a dropped living room, here having the extra purpose of making the dining space virtually a gallery from which to enjoy the view through living room windows. Even the patio gets a piece of the view, right through the house. Or, the guest in the entrance foyer has the same elevated viewpoint. Here is one place in which the old dropped living room idea has a purpose.

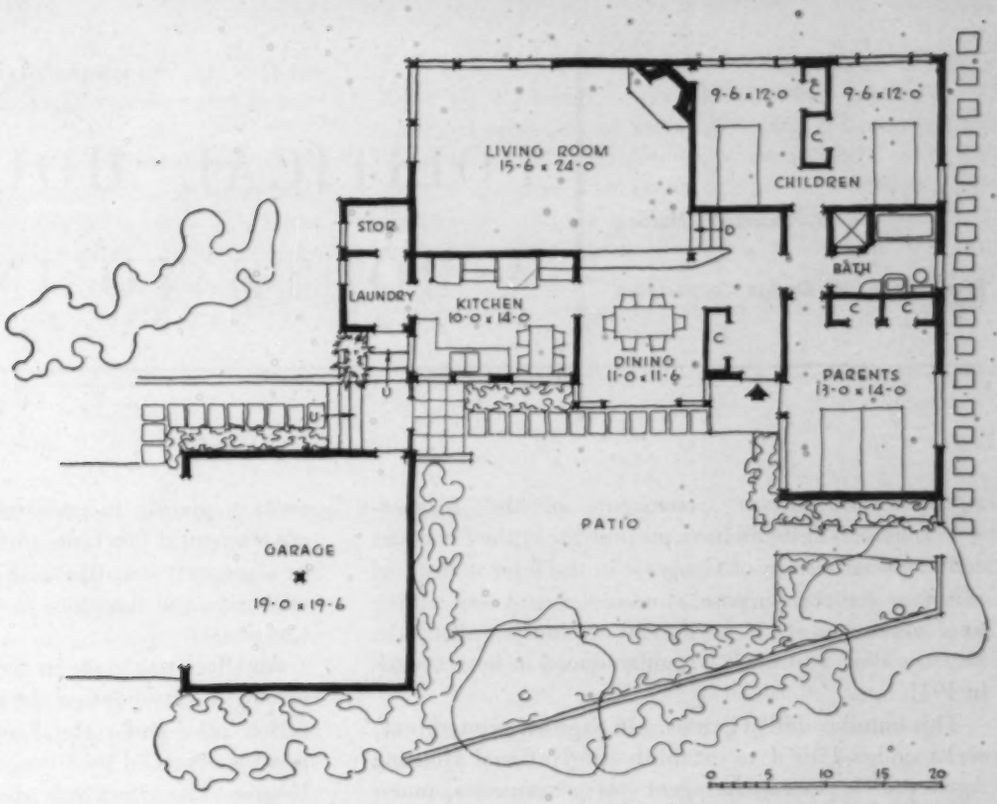
Residence in Orinda, California,
Michael Goodman, Architect





PHILIP FEIN Photos

FOR A VIEW


LIVING ROOM
15-6 x 24-0
9-6 x 12-0
9-6 x 12-0
CHILDREN
STOR
LAUNDRY
KITCHEN
10-0 x 14-0
DINING
11-0 x 11-6
BATH
PARENTS
13-0 x 14-0
PATIO
GARAGE
19-0 x 19-6
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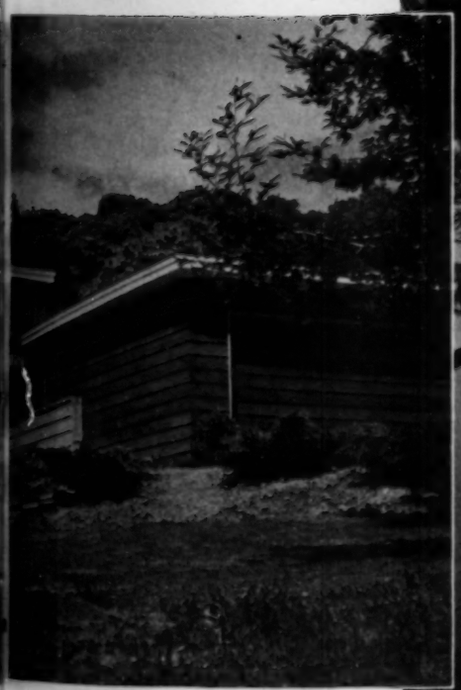

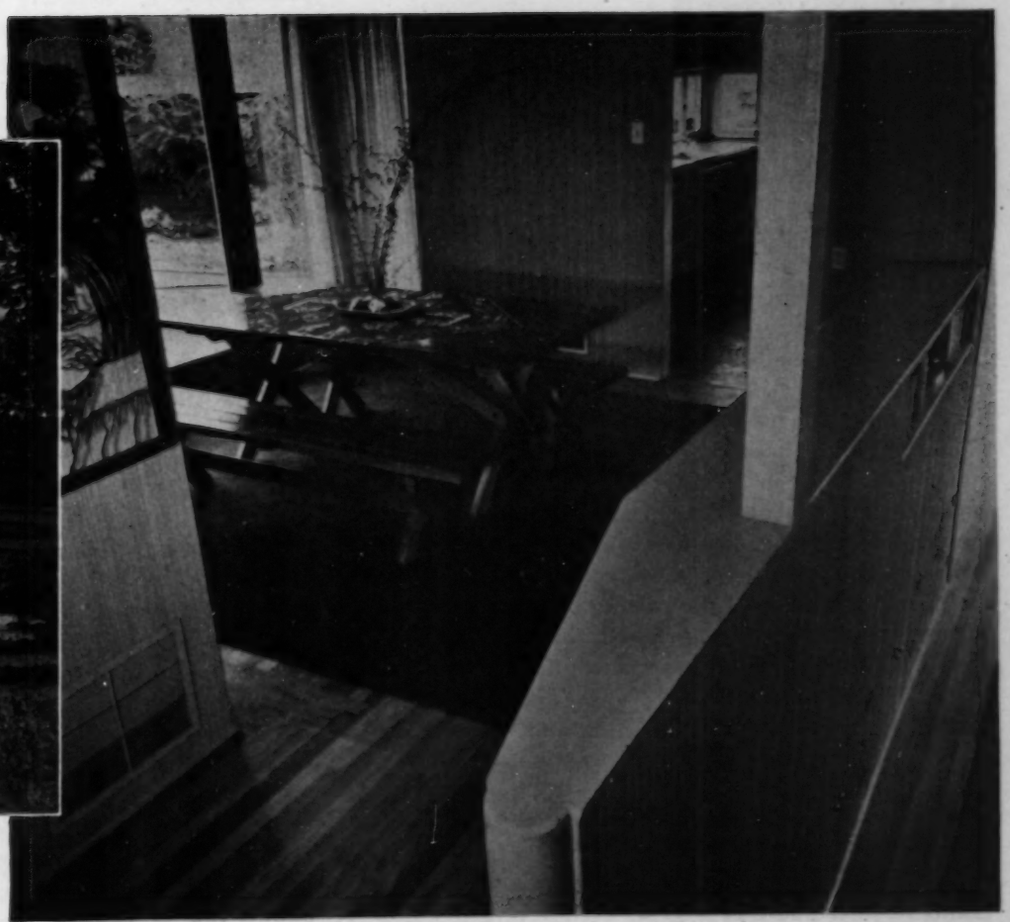

POLITICAL HOUSING— A ROUTE TO INFLATION

By Thomas S. Holden

President, F. W. Dodge Corporation

NON-CONGRESSIONAL proponents of the Wagner-Ellender-Taft Bill have proposed that the President call a special session of Congress in the later months of this year for the purpose of considering it and taking final action on it. If no special session is called, the measure dies, and must be reintroduced in both houses in 1947.

This omnibus bill (11 titles, 116 pages of printed text) seeks under Title I to establish the National Housing Agency as a permanent agency of government, under which would be consolidated the Federal Home Loan Bank Administration and its various constituent agencies, the Federal Housing Administration, and the Federal Public Housing Authority.

Concentration of Power

Such consolidation would abolish permanently the Federal Home Loan Bank Board, which was created by Congress and has not yet been abolished by that body, though temporarily suspended by the administrative order which created the National Housing Agency as a temporary war agency. This consolidation would reduce the commissioners of the three constituent agencies of the permanent NHA to the status of mere administrative deputies. It would concentrate the policy making power for these three agencies in the hands of a single politically appointed administrator. The Home Loan Bank System's member institutions have assets totaling over $6,000,000,000. The Federal Housing Administration has mortgage insurance in force totaling more than $7,500,000,000. These two federal agencies constitute a dominant factor in the mortgage lending and private long-term investment of the people's savings. It is to me unthinkable that Congress will authorize the concentration of power over these agencies that is contemplated in Title I. If the pattern of unification that is here proposed should be followed, the least that Congress can do to assure the people of this country that sound policies will be followed under such unification would be to put the policy-making and coordinating function under the jurisdiction of a well-selected board, rather than under an individual.

Furthermore, consolidation of the two great agencies that deal with private savings and mortgage finance, with FPHA, which deals exclusively with government grants in furtherance of a social welfare program, presents a glaring inconsistency. Sound organization of governmental functions would place FHLBA and FHA in a properly constituted Federal Loan Agency, whose authority and functions should be carefully defined by Congress.

An effort was made in the 79th Congress to rush this proposed consolidation through Congress as a reorganization plan under the Reorganization Act. This proposal was vetoed by a concurrent resolution of the two Houses. The effort was also made to sell the General Housing Act to Congress and the public on the plea of emergency. Indeed, the specious emergency plea was largely responsible for the speedy passage of the measure by the Senate.

This emergency plea has no foundation in fact. The present housing emergency is due to shortages of materials and to confused trends in material prices and construction costs. Congress has dealt with these emergency conditions by other legislation. There is nothing in the General Housing Act having any bearing upon these emergency conditions. This is a long-term measure, to be judged solely on long-term considerations. The speciousness of the emergency plea adds weight to the contention of some critics that the veterans' emergency housing program is mainly a political subterfuge whose real purpose is to put through this planned-economy measure.

Rather than enter into a detailed discussion of the remainder of this Bill, title by title, I shall attempt to summarize the considerations that have prompted me to oppose this Bill in its present form.

"Need" Based on Imaginary Statistics

Aside from the emergency plea, which seems to me entirely specious, the supposed need for this legislation has been presented to the Congress and the public by means of a quite fanciful picture of the long-term housing needs of the country, a picture composed of imaginary statistics.

In November, 1944, the National Housing Agency published a report entitled "Housing Needs." It purported to show a need for the construction of 12,600,000 new non-farm dwelling units in the United States during the first ten years following the war. Such a program would call for new construction at an average annual rate of 1,260,000 units a year. This figure has

"It is to me unthinkable that Congress will authorize the concentration of power over these agencies that is contemplated in Title I."

"This is a proposal for a government-sponsored housing boom of vastly greater proportions than any speculative boom of the past . . . In short this Bill is highly inflationary . . . Titles III and IV . . . include provisions for liberalization of private mortgage lending and government mortgage insuring practices which . . . would be positively harmful."

"Long-term commitments for federal grants-in-aid under Titles VI, VII, and VIII total $133,000,000 a year for 45 years, an aggregate of $6,000,000,000. It is proposed that Congress make these long-term commitments at a time when the need for them cannot possibly be proved and when the primary fiscal problem of the nation is to balance its budget."

"There may be some possible merit in Title V . . . an experiment . . . can do no harm and might prove beneficial."

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been quoted repeatedly by numerous proponents of this Bill.

The earlier postwar decade of the 1920's had housing production at an estimated average annual rate of 700,000 new family dwelling units a year. That earlier postwar decade had the largest numerical increase in population, the greatest peacetime prosperity, and the largest volume of construction activity of any decade in the country's history. These facts immediately raise the question as to whether the NHA estimates of needs for the coming decade may not be excessive.

New Families and Replacement Rates

According to the NHA report the supposed need for 1,260,000 new family units a year was composed of two equal parts:

1. A primary need of 630,000 units annually to take care of actual increase in families plus migration from farms, servicemen's households to be established or reestablished, undoubling of married couples living with another head of family and a 5 per cent vacancy allowance.

2. An additional secondary need of 630,000 units a year in order to replace each year one-twentieth of the country's substandard structures; that is to say, structures supposed to be substandard according to certain statistical data reported in the housing census of 1940.

It is this projected replacement rate of 630,000 units a year that is subject to question.

The same NHA report stated that the replacement rate during the twenty years 1920–1939 averaged 40,000 units a year. Each year some 20,000 units were destroyed by fire or other calamity, and another 20,000 were demolished to make way for some non-housing type of development or improvement.

Questionable Economics

Few people, if any, would question the desirability of increasing the country's previous rate of replacement of old and substandard housing accommodations. As to whether it is practical or economical to step up the replacement rate from 40,000 units a year to 630,000 units a year there is a serious question. A careful estimate of the cost to the national economy of scrapping old buildings at the recommended rate gives a minimum figure of a billion dollars a year for the loss to be absorbed by owners, mortgagees or government. Furthermore, there is no evidence to show that either the 1940 census enumerators who reported data as to structures needing major repairs and structures either having or lacking running water and plumbing and heating facilities, or the economists in the office of NHA, had any knowledge as to how many of the supposedly substandard units were actually susceptible of improvement.

Census Bureau Reports Improved Housing Facts

As a matter of fact, a great deal of improvement in the country's housing standards actually took place between 1940 and 1945, without benefit of this proposed legislation and in spite of the handicaps of a war economy.

I make this statement on the basis of the spot survey of housing conditions made by the Census Bureau in November, 1945. That survey showed, as between April, 1940 and November, 1945, the following improvements in housing conditions:

1. Home ownership increased from 44 per cent to 53 per cent.

2. Units needing no major repairs increased from 82 per cent to 89 per cent.

3. Units having private bath and private toilet increased from 52 per cent to 62 per cent.

4. Units with central heating increased from 58 per cent to 61 per cent.

5. Units with electric lighting increased from 79 per cent to 89 per cent.

6. Evidence of improved occupancy conditions was also shown. The number of units occupied by more than four persons declined from 27 per cent to less than 22 per cent; the number with more than one person per room declined from more than 20 per cent to less than 15 per cent.

This survey report was not published until last May 16, thirty-one days after the Senate passed the General Housing Bill in the form given to the House of Representatives. It was previously argued before the Senate and the public that housing conditions had deteriorated during the war. On March 16, 1946, Mr. Chester Bowles said over the radio: "Naturally, the condition of our homes got a lot worse during the war — the 7,000,000 substandard city homes of 1940 grew to 10,500,000." Mr. Wilson Wyatt made a similar state-

ment before a public housing group in New York. While these two gentlemen may not have had, at the time these statements were made, personal knowledge of the Census facts that belied their statements, there is strong suspicion of attempted suppression of the Census report by obstructionist tactics of people in OPA and NHA.

These statistical matters have been cited in some detail to support the following propositions which I hold to be true:

1. Improved housing conditions can be effected by the people of this country in a period of reasonable prosperity without excessive liberalization of housing finance or lavish government subsidies.

2. The NHA estimates of postwar housing needs of the country are fantastic; they are figures blown up for use as sales arguments to Congress and the public, without sound economic validity.

It is my strong belief, on the basis of careful study of all the available facts, that a program for construction of 12,600,000 new non-farm dwelling units in ten years, if actually carried out by means of this legislation or by any other means, would so far outstrip the actual housing needs of the country as to create an economic crisis of the first order. I do not believe that, even under the most prosperous conditions possible, the market can possibly absorb new housing accommodations at the rate of production proponents of this Bill promise to accomplish. This is a proposal for a government-sponsored housing boom of vastly greater proportions than any speculative boom of the past, or any boom at all likely to be stimulated in the future by private builders, real estate men or speculators. In short this Bill is highly inflationary.

Inflationary Features of the Bill

Inflationary features of this proposed Bill are of two kinds:

1. Over-liberalization of housing finance, as provided in Titles III, IV and possibly VIII.

2. Long-term commitments for government spending, in the form of grants for public housing and for urban redevelopment, as provided in Titles VI and VII.

Titles III and IV, which would amend the Federal Home Loan Bank Act, the Home Owners Loan Act of 1933, the National Housing Act, and the United States Housing Act of 1937, include provisions for liberalization of private mortgage lending and government mortgage insuring practices which I consider excessive. Under the legislation of the past 14 years the Federal Home Loan Bank System and the mortgage-insurance system of the Federal Housing Administration have functioned with gratifying success. These agencies are well established and well prepared to meet all presently foreseeable needs for home-financing. In addition, the Congress has provided extremely liberal home-financing facilities for veterans under the G.I. Bill of Rights. With private mortgage money amply available at this time and with tested financing machinery in full operation, such liberalization as is proposed in the General Housing Bill would be positively harmful. It is not only inflationary, in view of present conditions, but is contrary to sound principles of mortgage finance.

Unneeded Federal Subsidies

Long-term commitments for federal grants in aid under Titles VI, VII and VIII total $133,000,000 a year for 45 years, an aggregate of $6,000,000,000. It is proposed that Congress make these long-term commitments at a time when the need for them cannot possibly be proved and when the primary fiscal problem of the nation is to balance its budget.

At a time when we have approximately full employment with wages the highest in history and with many important industries and trades suffering from labor shortages it is absurd to make large commitments for subsidized housing. If there should be later a demonstrated need for grants-in-aid to public housing, Congress can then make suitable provision for them.

Grants-in-aid for urban rehabilitation, as proposed in Title VI, are unnecessary and are potentially demoralizing. Federal subsidies to local governments and the agencies thereof are generally unsound in principle and should be used only as temporary expedients in drastic emergency situations. Financial dependence of local governments upon the federal treasury tends to by-pass the authority of the states, to further centralization of power and to encourage political abuses. Furthermore, federal subsidies in aid of purely local governmental functions, including public works and improvement programs, tend toward extravagance and waste.

The problem of urban redevelopment, which Title VI aims to solve, has long engaged the attention of business and civic groups throughout the nation. Twenty-two states have adopted laws offering specific encouragement for urban redevelopment; most of them seek to encourage private enterprise and private capital to undertake the job; powers of condemnation and tax-incentives are the inducements offered.

Since the first of these laws was enacted as late as April, 1941, they have all been thus far precluded from functioning effectively by war conditions and war and postwar restrictions. Their actual functioning (as written or as they may be later amended) will depend very largely on the postwar relationships of rents and development costs, relationships which must reach a more stable condition than at present before investment will be forthcoming. These state laws should be given an opportunity to perform under peacetime conditions before the highly dubious expedient of Federal subsidy is resorted to.

While opposed to federal grants-in-aid to local governments, I consider it entirely possible that sound pro-

vision could be made for extending credit or insuring mortgages in ways that would facilitate local redevelopment programs without injecting the federal government improperly into local government affairs.

In spite of my opposition to this Bill as a whole, I find merit in some of the provisions of the General Housing Act. However, such meritorious activities as are proposed do not require the unification of housing agencies that is called for under Title I. Those which are needed can be more soundly provided by separate legislation than by enactment of this omnibus Bill.

I refer specifically to technological and economic research in housing, the subject of Title II, and the annual housing inventory, which is the subject of Title X. These functions, under proper enactment, could be assigned either to the Federal Home Loan Bank Administration or the Federal Housing Administration, or to some appropriately constituted coordinating agency. They might even be properly assigned to the Department of Commerce. The annual housing inventory should be conceived as a matter of providing public information, not as a basis of government programming of all the public and private housing activity of the country.

There may be some possible merit in Title V, which provides for yield insurance to be administered by FHA. The insurance provisions are conservatively safeguarded; I do not consider them inflationary, though some people do. I do not know whether as a practical matter the proposed yield insurance would encourage a substantial volume of rental housing. An experiment with this idea, as projected, can do no harm and might prove beneficial. There is a question whether investment incentives for rental housing have kept pace with the enlarged incentives to home ownership that have been developed in recent years.

Any desirable features of Title IX, covering disposal of surplus war housing, can be enacted separately. There can be no objection raised to provisions for preference to veterans; provisions for sale to public housing authorities go beyond the previous intent of Congress as expressed in the Lanham Act.

In summation, I would say that many of the features of this omnibus Bill are highly objectionable for reasons that I have outlined. If long-term measures as comprehensive in character as those proposed in this Bill were needed, it would be quite impossible to draft sound legislation to cover all of them at this present moment, when the economic picture is so confused. The future housing needs and the future housing activity of the country will be determined by our future levels of prosperity and family incomes, and by future levels of rents and construction costs in a free market, factors which are quite unpredictable in the present stage of transition. If we did not already have ample facilities for financing residential building recovery, the situation would be different.

Consolidation of federal housing agencies should be considered by Congress in terms of the whole policy of the federal government respecting banking functions of the Federal Home Loan Bank Administration, the mortgage-insuring functions of the Federal Housing Administration, the capital-credit functions of the Reconstruction Finance Corporation and the functions of other federal lending agencies.

Specific proposals for amending existing housing laws or for initiating new governmental housing activities should be made in the form of separate bills rather than in an omnibus bill like S. 1592, which is extremely difficult for Congress to appraise adequately and critically in all its voluminous details.

THE Wagner-Ellender-Taft Bill — "General Housing Act of 1946" (S.1592) — was passed by the Senate on April 15, 1946. Hearings were started before the House Committee on Banking and Currency, but discontinued when Congress adjourned.

This Bill is an omnibus measure of 11 titles, 116 pages, 27,000 words.

Title I: would perpetuate wartime NHA over FHA, FHLBA, and FPHA; would thus concentrate policy making power for three divergent agencies in a single politically appointed administrator.

Title II: would appropriate funds for technical and economic research in housing, also for local surveys and planning.

Title III: would expand lending powers of federal S & L associations, liberalize FHA Title I and II programs; would provide for lapsing of principal and interest payments on FHA loans up to three years; would ask builder's warranty of construction for one year.

Title IV: would drastically liberalize FHA insurance with "special systems of mortage insurance for families of lower income," contemplating "all proper incentives to cost reduction through . . . new materials, techniques and methods . . . and elimination of unnecessary restrictive practices . . ."

Title V: would provide for yield insurance by Government, administered by FHA, guaranteeing amortization and limited return to investors in multi-family housing.

Title VI: would offer grants-in-aid for land acquisition for urban redevelopment, the federal government to stand two-thirds of the loss in land costs.

Title VII: would authorize contributions for construction of public housing, involving $4,000,000,000 of federal funds over the next 45 years.

Title VIII: would expand public housing in rural areas, through the Department of Agriculture, involving $1,125,000,000 of federal funds over the next 45 years. It would also authorize the Secretary of Agriculture to furnish "without charge or at such charges as the Secretary may determine, technical services such as building plans, specifications, construction supervision and inspection . . ."

Title IX: would give preference to veterans in the disposition of war housing.

Title X: would provide for an annual inventory of housing, with recommendations as to future programs.

Title XI: legal miscellany.

"WE WILL BUILD MODERN CHURCHES"

By John W. Ragsdale, Associate Editor

ARCHITECTURAL RECORD'S

BUILDING TYPES STUDY NUMBER 118

WHEN we build again, the war being ended, we will build modern churches. We will take advantage here, as in every other field of . . . new materials . . . new methods of construction . . . new planning techniques. We will deny to the Church no serviceable instrument, whether it be a machine or a new form of shelter which we are able to give Her; nor will we think that the imagination and invention, the surprise and daring of a new architecture are uncongenial to the Christian spirit."

So wrote Joseph Hudnut* in ARCHITECTURAL RECORD, September, 1944. Human building, at the time, in every enlightened field was much in eclipse to the stupendous pervasion of total war. But the right side was winning. "Imagination and invention" would soon be free to build, as well as new churches, an entire new world, unified by a new spirit; or, perhaps, to reshape a new and better international form out of the old pieces, in which a strong binding element would be the reaffirmation of an ancient ideal — a new moral and political "architecture" of nations, "not uncongenial to the Christian spirit."

"When we build again, the war being ended . . ." In September, 1945, the war being ended, Walter A. Taylor† writes in the RECORD: "Whereas 15 years ago 'shop talk' among ministers was about Sunday School methods, and a decade ago the emphasis was upon weekday programs of social, recreational and community service activities, today . . . ministers . . . are reading, writing and talking about what they can do to 'vitalize' their services of worship." (For all the worthy effort between wars to make the Church a more vital and influential factor in Christian living, through increased social and recreational activities and intensified religious education, something still was lacking — acutely realized during and at the conclusion of the greatest war, we hope, in human history.) Mr. Taylor goes on to say: "It is now realized that neither the social hall nor the Sunday School, but rather the Sanctuary, is the power house which activates the whole insititution."

Shortly before undertaking this Building Types Study on Churches, in August, 1946 — the war being ended one year — RECORD editors received from Jean Labatut‡ a critical estimate of a particular building (not a church) which concluded with the following general statement: "Perhaps all this indicates that architectural expression corresponding to the needs, demands and means of today is not yet 'around the corner,' and that the chaotic architectural expression in which we live is due to an abundance of physical means and a paucity of intellectual, spiritual and moral qualities." We wondered if, in his regard, churches — being planned and built today with the war being ended one year — were a part of "all this" indicating "chaotic architectural expression . . . abundance of physical means and a paucity of intellectual, spiritual and moral qualities." Unhappily, he declared, in many cases churches are, indeed, a part — a great and tragically significant part. Much too frequently they express the essence of the confusion, the fumbling, the double talk, the misunderstanding, the mistaken aims, causing the abundant fragments of old orders and new visions to be booted and scattered further, or else jumbled together in heart-rending flummery, not only on earthly plots but at peace conferences — and the war being ended one year!

In 1900 Ralph Adams Cram looked upon American ecclesiastical architecture and was unhappy.§ For the most part all that he saw was regrettable, from the proliferation of country churches — "wholly bad in shape and composition . . . doubly hideous through the arched windows, the silly wooden buttresses, the futile belfries and pinnacles" — to the variegated ugliness and paltriness of the village (or parish) and city churches, and the three or four American cathedrals. He called for a triennial conference of church architects and clerical and lay members for a thorough discussion of the whole question of art in relation to the Church. He was convinced that in such a conference "one decision would be reached unanimously . . . to take up the architectural life of the Church where it was severed in the sixteenth century and carry to its logical and glorious development the work begun by William of Wykeham, Bishop of Winchester. Our present chaotic methods, Romanesque and Colonial, Italian and French Renaissance, the early Gothic of France and Germany, Spain and England would be abandoned." Build American cathedrals, he besought, in the "one style, and one only, that is for us . . . the English Perpendicular" and from these splendid examples all the lesser edifices — in town and village and country — must inevitably take their inspiration and in their lesser character truly reflect and eloquently communicate the Christian spirit.

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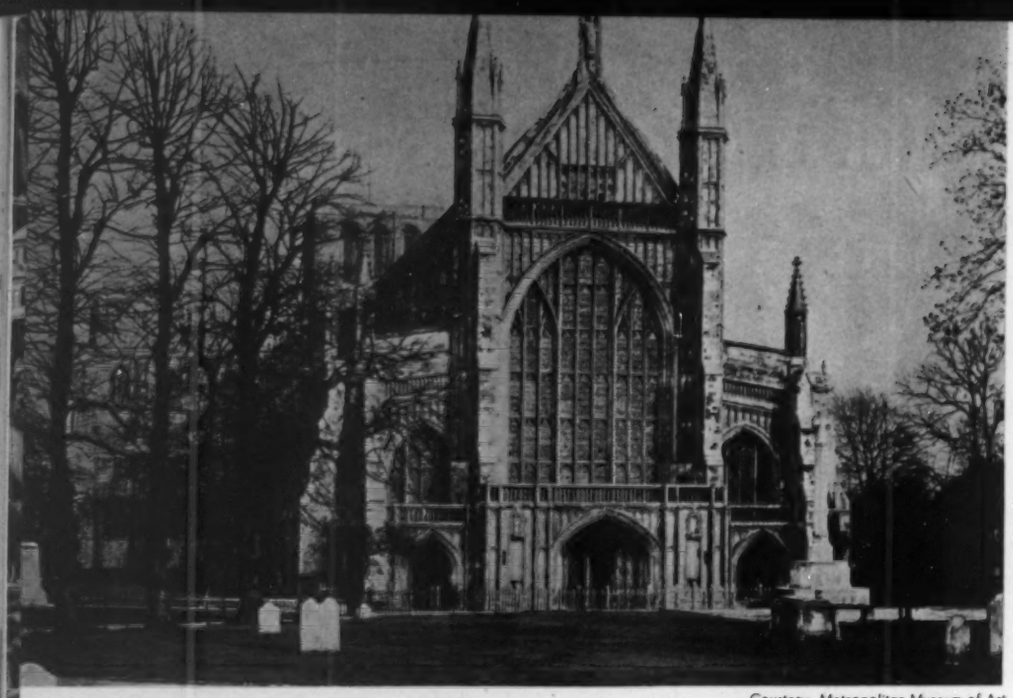
† Professor of Architecture and History of Architecture, Syracuse University. Consultant to the Interdenominational Bureau of Architecture.
‡ Professor, Chief Critic of Architectural Composition, Princeton University.
§ "Church Building." A study of the Principles of Architecture in their Relation to the Church.

EDITIONS "TEL" Photo



Courtesy: Metropolitan Museum of Art

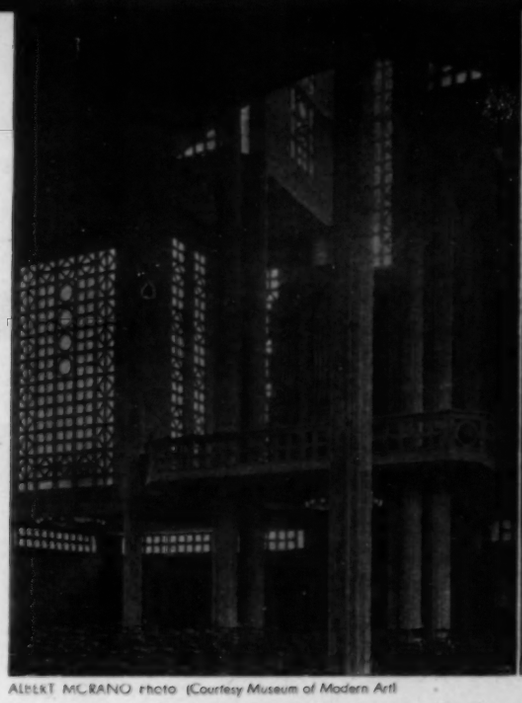
Winchester Cathedral, West Façade: ". . . the one style, and one only, that is for us . . . the English Perpendicular." After 25 years and a world war, Ralph Adams Cram discovered a broader basis for the "new fabric of religious architecture . . ."

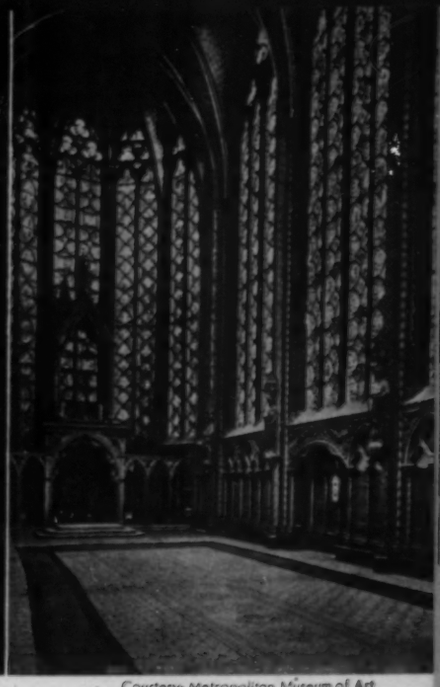
Most readers undoubtedly are familiar with Cram's words, and perhaps his feelings. Perhaps many have also contemplated the majesty of Winchester Cathedral and have likewise been moved before the West Façade "to strive to get something of *that* into my own work in my own day." But most readers also know that there *was* a Reformation, that the Roundheads *did* march into Winchester Cathedral during service, "with colors and drums, doing irreparable damage," that we *are*, inescapably, the inheritors as well of the dissident tradition expressed in England by Wren and Inigo Jones and Gibbs, who "could not build churches, though they did." Cram in 1900 might deplore our colonial examples as "only crude imitations, without any artistic value whatever, and precious only from an historical standpoint." But they *were* History! He might also, in 1900, set himself further against history by proclaiming that the Church of St. Mary the Virgin in New York City, though it had "the height and the simplicity of mass that were necessary," was yet "erected after an evil fashion, falsely and unpardonably, with a frame of steel like an office building, supporting the sheathing stone that was worked into the forms of honest construction . . . an example of all that should be avoided."

In 1923, the war being ended, Ralph Adams Cram added to his manifesto a postcript, stating "There is nothing in the earlier editions the author would retract . . . unless perhaps it were the rather narrow enthusiasm for the latest phase of English Gothic as the sole basis for the new fabric of religious architecture. . . . Perhaps religion seems less national, less racial than once it did, and so essentially more catholic as well as Catholic. . . .The more one studies these arts, the more at one they seem in all their underlying principles, and all touched with some divine beauty . . ." And further: "If the craze for high buildings continues, city churches must be content no longer to dominate their surroundings, but rather to call men through their contrast . . ." And in final summary and conclusion: "It is not that the church building today (the best of it) is so much inferior in point of design to . . . Bourges, Lincoln, Seville. Where it fails is in what the architect cannot give and that is *life*. . . . I am not arguing for a 'new style' in the sense of . . . something . . . anarchical in its impudent defiance of law and precedent, cut off from all continuity of succession and answering to nothing in the real life of society, like . . . cubist sculpture . . . cacophonous music and vers libre. . . . Each new thing is fathered by its antecedent, if it is legitimate. It may be, in its maturity, far different in personality to its progenitor, but the inheritance is there. Chartres is the triumphal son of Caen, the father. . . .When religion regains its past vitality and marks this by a restored unity, then it will be content neither with the anarchic and amorphous monstrosities . . . nor yet with the thoughtful and scholarly restorations . . ."

And so in October, 1946, how do things stand with the Church? What evidence is there of *life*, of "vitalization"; what prospects of new and better forms issuing from the legitimate parenthood of the past? In the first six months of the year, more than 900 church construction projects, to cost $37,160,000, were reported by Dodge services. And in just *one* recent month, 331 new projects were reported in the actual planning stage, valued at $27,170,000! Certainly this is heartening testimony to the presence of strongly pulsing life *blood*, at any rate.

But how is this life blood to be incorporated? Two years ago Dean Hudnut prophesied: "Progress will be first evident in the interior. There the ceremonial is unchanged and yet is reclothed by each generation according to its spirit. The ancient symbols will remain—altar, choir and central aisle — but not the heavy pillars, the complicated vaults, the dim religious light. A simple room, Greek in its clarity, with quiet walls and clear light." And by a legitimate transitional process, not anarchical or impudent in defiance of tradition and precedent, "the simplicity and quietude of the interior volumes will be reaffirmed in the exterior shapes."





Far right: Sainte-Chapelle, Paris. Right: Notre Dame du Raincy, A. and G. Perret, Architects. "Each new thing is fathered by its antecedent . . . It may be in its maturity far different in personality . . . but the inheritance is there."

ALBERT MORANO photo (Courtesy Museum of Modern Art) Courtesy: Metropolitan Museum of Art

Charles D. Maginnis, F.A.I.A., writing in the same issue of the RECORD with Dean Hudnut, believes that: "In a world of disconcerting and dramatic change old ideas are expected to make submission. Nevertheless, the Church is an institution that may in complete propriety choose its own accommodations. No interest is more removed from the hysterical importunity of novel principles. It will come to its rightful authority in American art by holding in a spirit of moderation to a sense of its independent mission, rather than by a deflecting course which involves the violent disqualification of history."

And again in the same issue, Brother Cajetan Baumann, O.F.M. says: "A certain change of attitude is taking place, a marked influence toward greater simplicity. . . . All else must be subordinated to the altar. The eye and the mind must be led immediately towards it. . . . There is a current tendency to bring the church closer to the public; to erect smaller churches but a greater number of them. . . . A proper setting gives the church both repose and dignity. . . . To attain respectable quiet, sound-deadening insulation and air conditioning are essential in planning the modern city church. Every means for making it clean and quiet, healthful and tranquil should be specified."

Walter A. Taylor concludes his remarks in last year's study by saying: "The designer who has a decent sense of the inherent dignity of the church can work over the basic patterns with the greatest of freedom, with completely non-traditional detail. . . . If it fulfills the relatively simple functional requirements, *and* is also the kind of place which, even when empty and silent, causes the man on the street to take off his hat upon entering, it will be a Church."

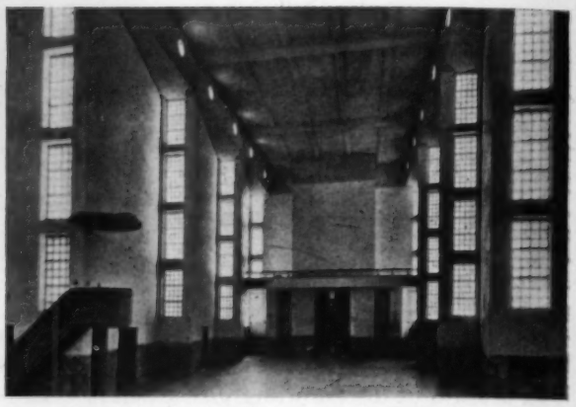
Professor Labatut supports Mr. Taylor's argument for primacy of the Sanctuary, and achievement of the sense of spiritual immediacy as foremost in objective, with an account of the 1937 Exposition Internationale at Paris. To him the experience of stepping out of the galaxial concentration of technology on parade, into the Pavillon Pontifical, with its exhibit of *autels* and religious objects was as immense and inspiring as anything in his memory. So effectively were modern principles of shelter and exposition adapted to the highlighting of altars and sacred art that reverent awareness was as manifest in visitors to the Pavillon as in pilgrims to Chartres Cathedral. (This writer, too, has felt the tremendous spiritual impact of Chartres; and recollects suddenly that equaling — perhaps even surpassing the experience — were a few moments in a pine woods, before a portable altar covered with a white table cloth and the simplest of sacred objects, set up by an army chaplain in the presence of several hundred frightened men.)

Professor Labatut gives counsel to many architectural students who come to him desirous of "doing" a church. He guides them, first, in simply the practical considerations imposed by chosen locality, site and denomination, number of congregation to be seated, services and activities to be included. Some return after protean thrashes on their own with questions of Style and Tradition and Precedent and avow, as indeed did one, that in their final determination the best church "was a good radio in a man's own living room." For all the superficial warrant of such a statement, there must somehow be induced in these students an awareness of the true and indispensable meaning of "Church." If such cannot be done, it is only by extraordinary happenstance, he believes, that they will ever design a successful one.

Other students want to do a "modern" church immediately, forthrightly and fearlessly. One such, for a small Catholic chapel in Ireland, adapted the concrete parabolic arch to an interior that, through sensitive and intelligent handling of the Sanctuary, was quite successful. A satisfactory resolution of the exterior, however, persistently eluded the student, dissatisfied with its starkness yet determined not to compromise his over-all principles in any egregious way.

It happened, relates Professor Labatut, at that time

"L'ARCHITECTURE D'AUJOURD'HUI" Photos



Above: design for a city church; W. H. Thomas, Architect; H. E. Wagoner, Associate Architect. "An attempt . . . to maintain dignity and importance in surroundings with which the Church cannot hope to compete in size." Right: a use of similar window technique in the Church of St. Michael the Archangel, Foggia, Italy; C. Petrucci, Architect.

a Gothic doorway belonging to a bishop's house of the *ancien régime* was much in the news, being energetically sought after by the Rockefeller Foundation. It was not, finally, to be removed from its original French location, but "suppose," he asked the student, "that you had this doorway to dispose of — would you put it in a museum?" It *was* inserted in the plan for the parabolic chapel, the area between it and the concrete arch filled with glass, and the result — in the opinion of both student and mentor — was a striking acknowledgment of the modern form's genuine and undeniable connection with the tradition and spirit of the past.

Valid new "styles" that modern church building may eventually achieve are only conjecturable to Professor Labatut. There are discernible, he believes, numerous hopeful evidences and indications. For example, he is able to show as graphic supplement to his lectures, lantern slides favorably comparing the interiors of Sainte Chapelle and Notre Dame du Raincy, by the Perret brothers. (Says Charles D. Maginnis: "After twenty years of weathering, the exterior of Le Raincy, however, confirms the idea that the virtues of concrete are best concealed.") Le Raincy is further significant to Professor Labatut in that it was achieved as the result of a competition — the winner in a final selection against three or four "traditional" entries, each to cost in the vicinity of four or five million francs. To a devout group of parishioners, Le Raincy was not only a thoroughly successful and manifest *Church*, but had further appeal to essential Gallic nature: its cost in estimate and in final figuration was near *one* million francs!

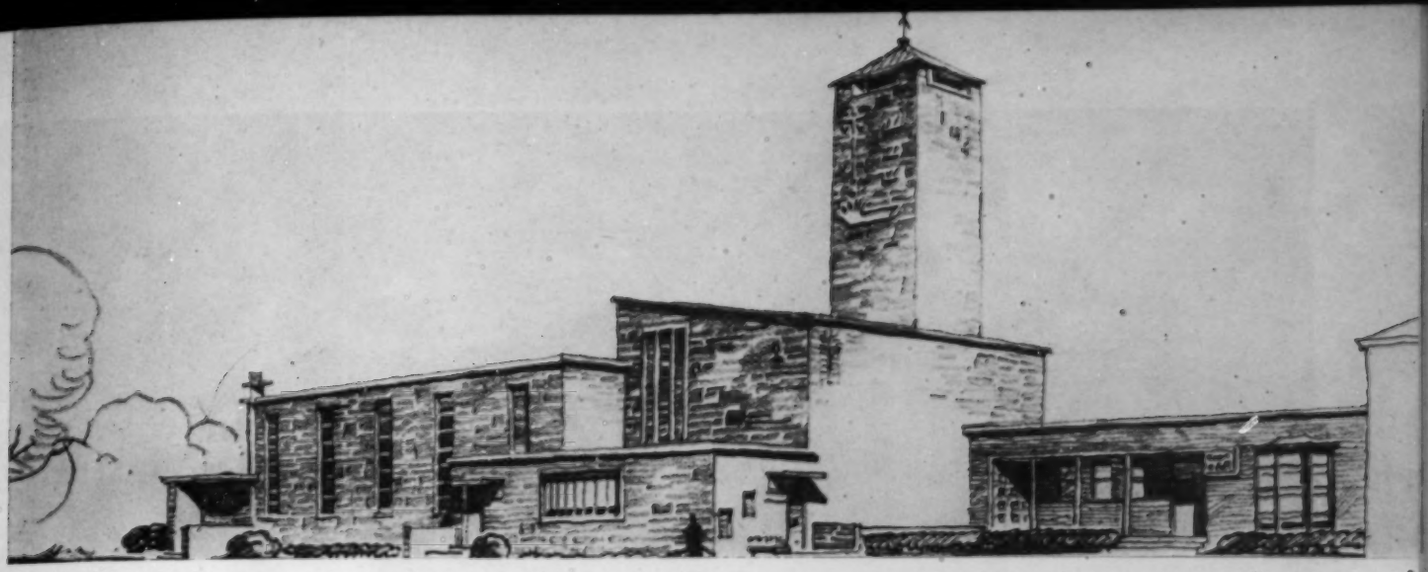
In general Labatut believes with Hudnut that new methods, materials and planning techniques *will* continue along the lines of successful indication, with "imagination and invention, surprise and daring" based on rediscovered concepts of Church "vitalization" and spiritual immediacy, toward a "new" architecture clothing and sanctifying and proclaiming both Christian ideal and new international order. And it will be done in "transitional" concatenation with essential precedent and tradition of the past, not in a way to trammel and restrain, but respecting and revealing, rather, the unseverable continuity of historical spirit and faith and aspiration from Gethsemane to Lake Success.

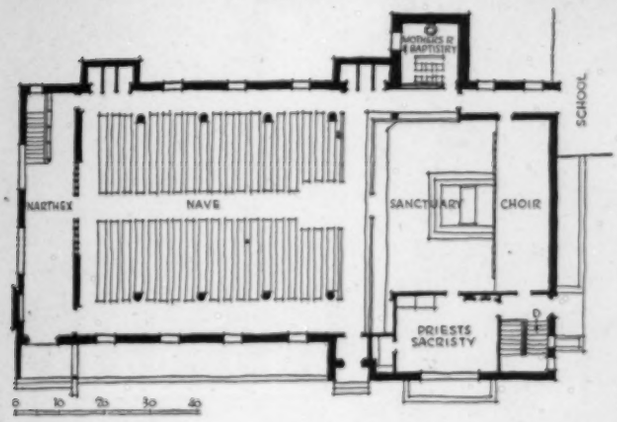
He hopes to see certain tendencies relegated to other more appropriate media than churches — such tendencies as: "cubistic architecture based on *abstract equilibrium of matter*, as is possible in painting or sculpture and even building of very small size; functionalism expressing the *physical aspects of man's nature* to the subordination and even exclusion of his intellectual and spiritual qualities."

He hopes to see more successful integration with nature — more effective usage of site and natural surroundings, in the case of rural and suburban churches. In town and city, leave mere "gigantism" to factory and office buildings where great and unobstructed working spaces are functional dictates. Let the Church try rather for its effect through considerations of contrast, sanctuary, and spiritual awareness and compulsion.

Let illumination also prevail again as a strong and pervasive ingredient in architecture — *natural* illumination, the plastic interplay of light and shade on the *outside*, in the air and sunshine. "Do you recall," he asked, "how the New York Fair — the 'World of Tomorrow' — really only came alive and splendid after nightfall?"

Architects, for they are notably men of good will — and in this he is confident — will indubitably achieve new and true forms for sheltering and expressing the Church, the Church of a religion which must, indeed, seem "less national, less racial than once it did," in a world which has started building again — the war to be ended forever.



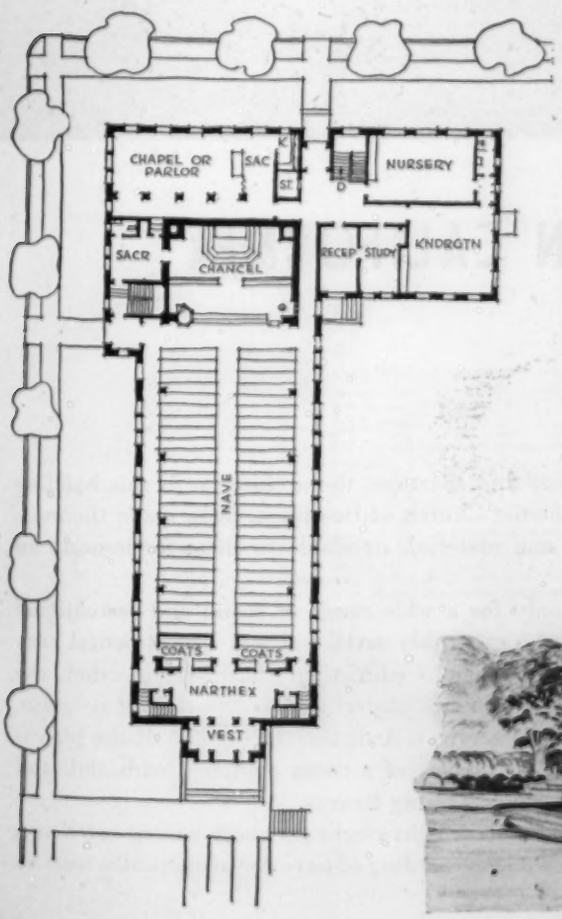


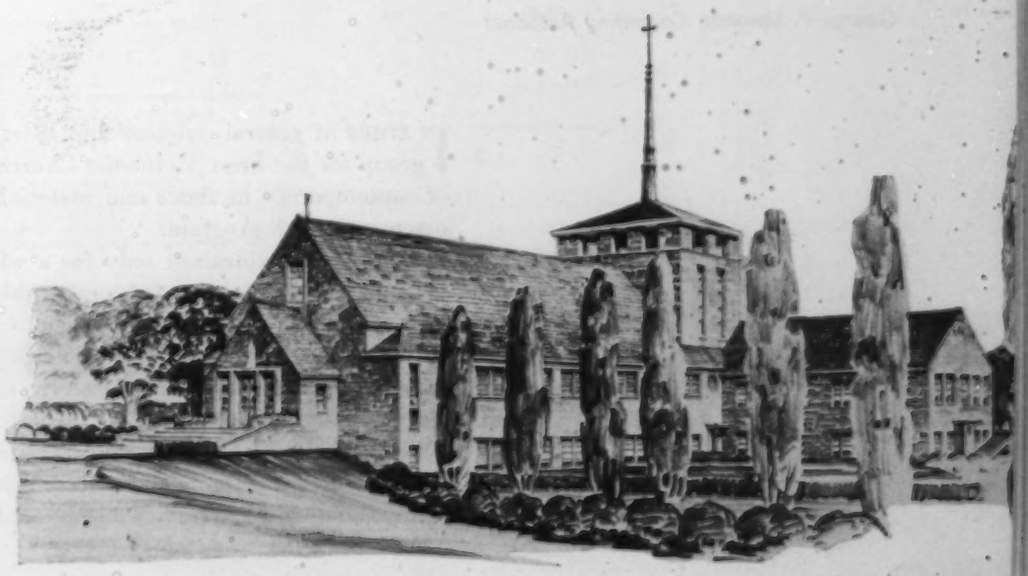
MINNESOTA CHURCHES

Hills, Gilbertson and Hayes
Architects

THESE two examples in Minneapolis are the latest results in this firm's program to "create churches rather than replicas" through "simplicity of design, without sacrifice of appropriate dignity, permanent materials or smooth functioning of plan." The Church of the Holy Childhood (above) is planned for the rim of a plot 11 ft. below level of the street serving both church and present adjoining school. Plan permits functioning of social hall beneath church in connection with lower-level parking and recreational areas. Other features are: choir at rear of Sanctuary; combined baptistry and mothers' room in tower; an altar permitting celebration of Mass from either side.

The Lake Harriet Lutheran Church (below) will also be built on a plot much lower than street level permitting similar function of a fellowship hall beneath the nave. "In the interests of economy, the chapel will double as a parlor. The rather low lines of the nave will be relieved by termination in a lofty, well-lighted chancel."





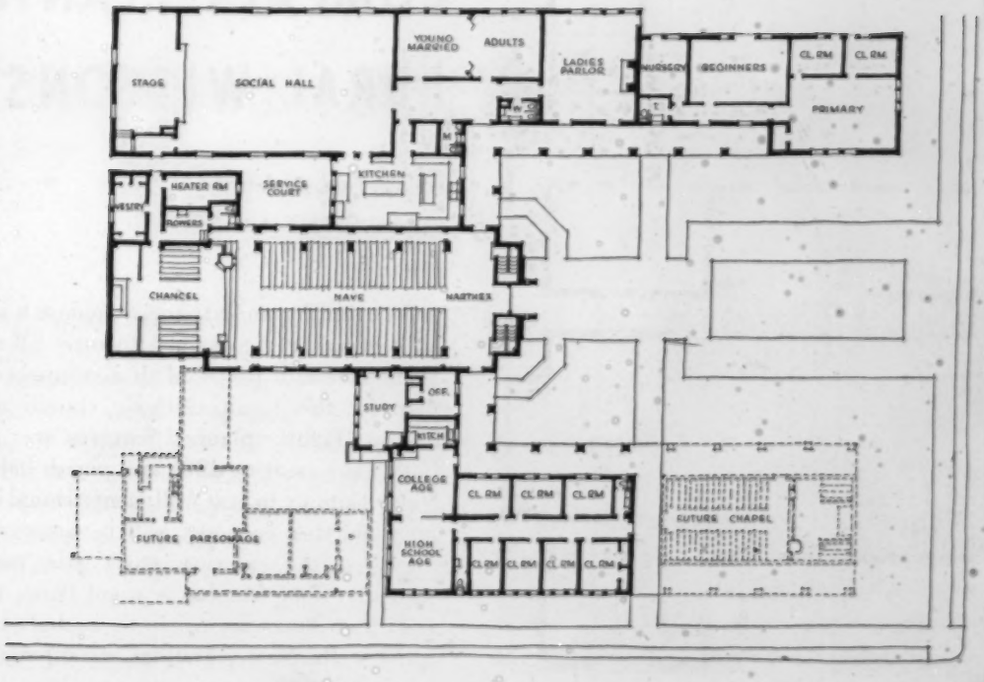
METHODIST GROUP IN CALIFORNIA

Vincent G. Raney, Architect
George P. Simonds, Consulting Architect

IN TIMES of general stricture and shortage, the architects, in this building group for the First Methodist Church of Petaluma, have made the most of contemporary methods and materials available to them for housing an extensive parish program.

The plan provides not only for a wide range of social and recreational activities, but also permits considerable divisional and departmental concentration in the conduct of religious education. In this connection, the future chapel may serve as a "worship center" in the educational program, as well as for the usual special services. A distinctive feature of the plan is the provision adjacent to the Chancel of a room equipped with sink and other facilities for keeping and processing flowers.

Construction is frame and stucco; lightweight tile roof; cement sub floors, with asphalt tile covering. Walls and ceiling of nave are acoustically treated.


STAGE
SOCIAL HALL
YOUNG MARRIED
ADULTS
LADIES PARLOR
NURSERY
BEGINNERS
CL. RM.
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PRIMARY
KITCHEN
SERVICE COURT
HEATER RM
VESTRY
CHANCEL
NAVE
NARTHEX
STUDY
OFF.
COLLEGE AGE
CL. RM
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FUTURE CHAPEL
FUTURE PARSONAGE
HIGH SCHOOL AGE
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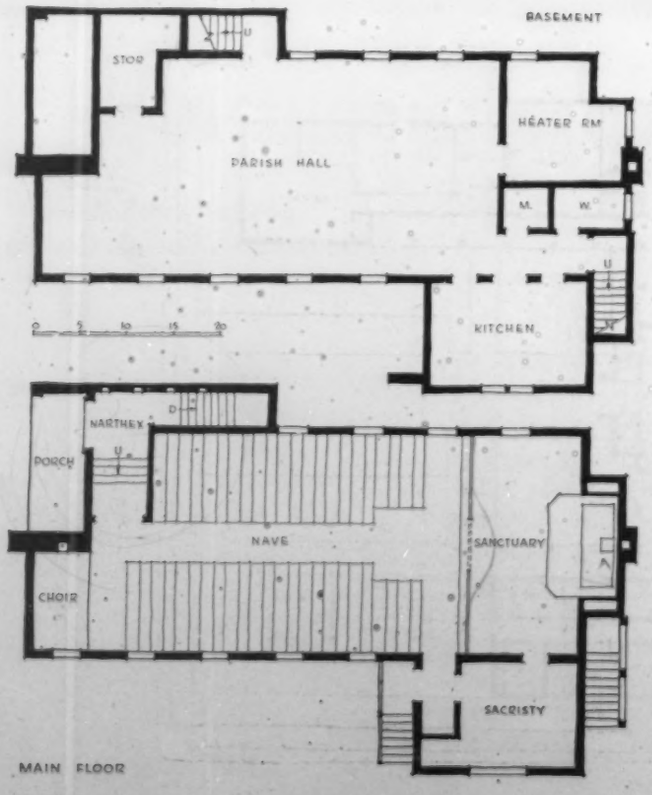
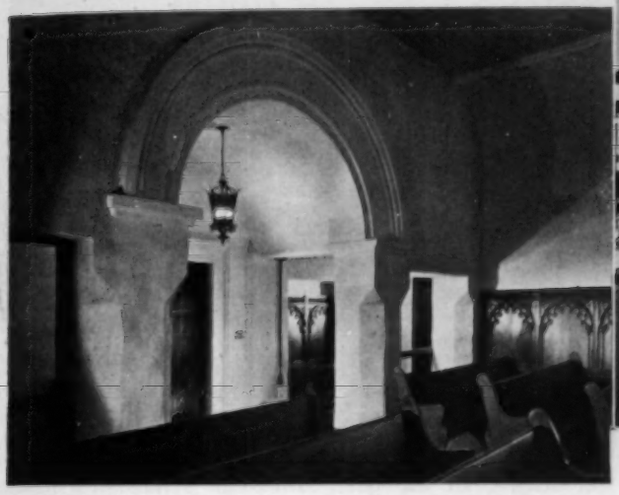


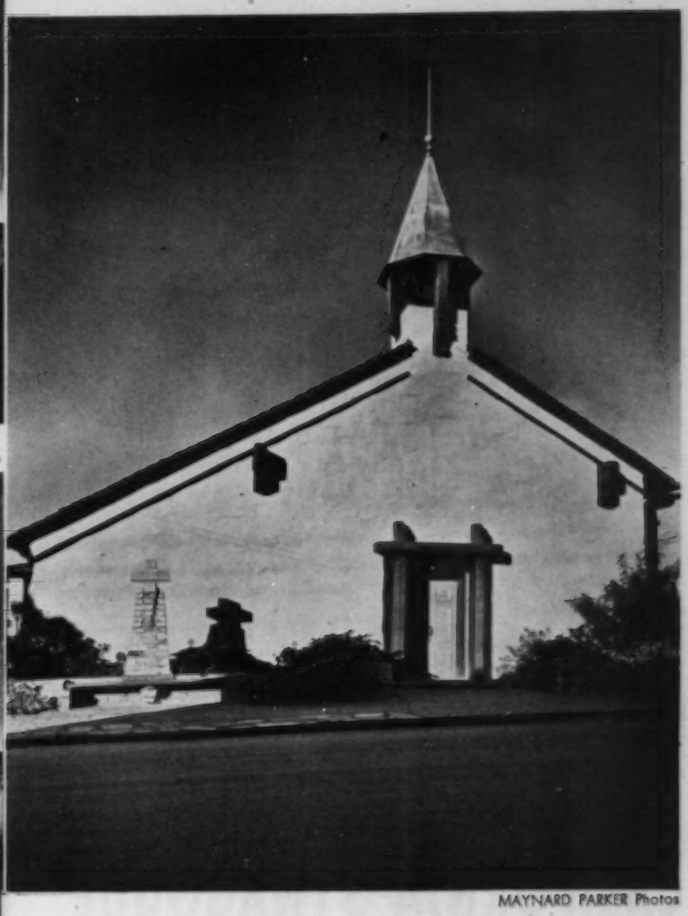
COMPACT PLAN FOR RURAL WISCONSIN

John J. Flad, Architect

Thomas H. Flad, Associate

CONFINED by an extremely modest budget, the architect has yet contrived to meet all requirements of committee and pastor with a compact and distinctive plan for this small Catholic church on a Wisconsin hilltop. Tightly planned features are: narthex serving both nave (seating 130) and parish hall beneath; altar framed simply in east wall; confessional in sacristy vestibule. Further economy will be achieved with common brick on the exterior, stock size wood sash, wood shingles. Roof framing is wood truss; main floor, steel joist. Sub floors are concrete, asphalt tile covering. Interior walls, plaster; ceilings, wood paneling.

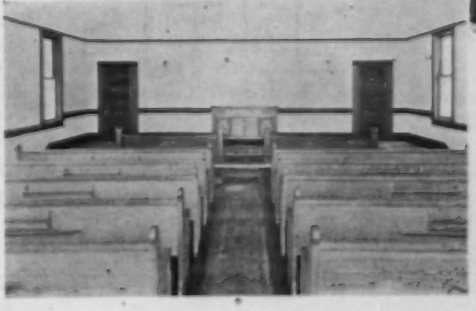




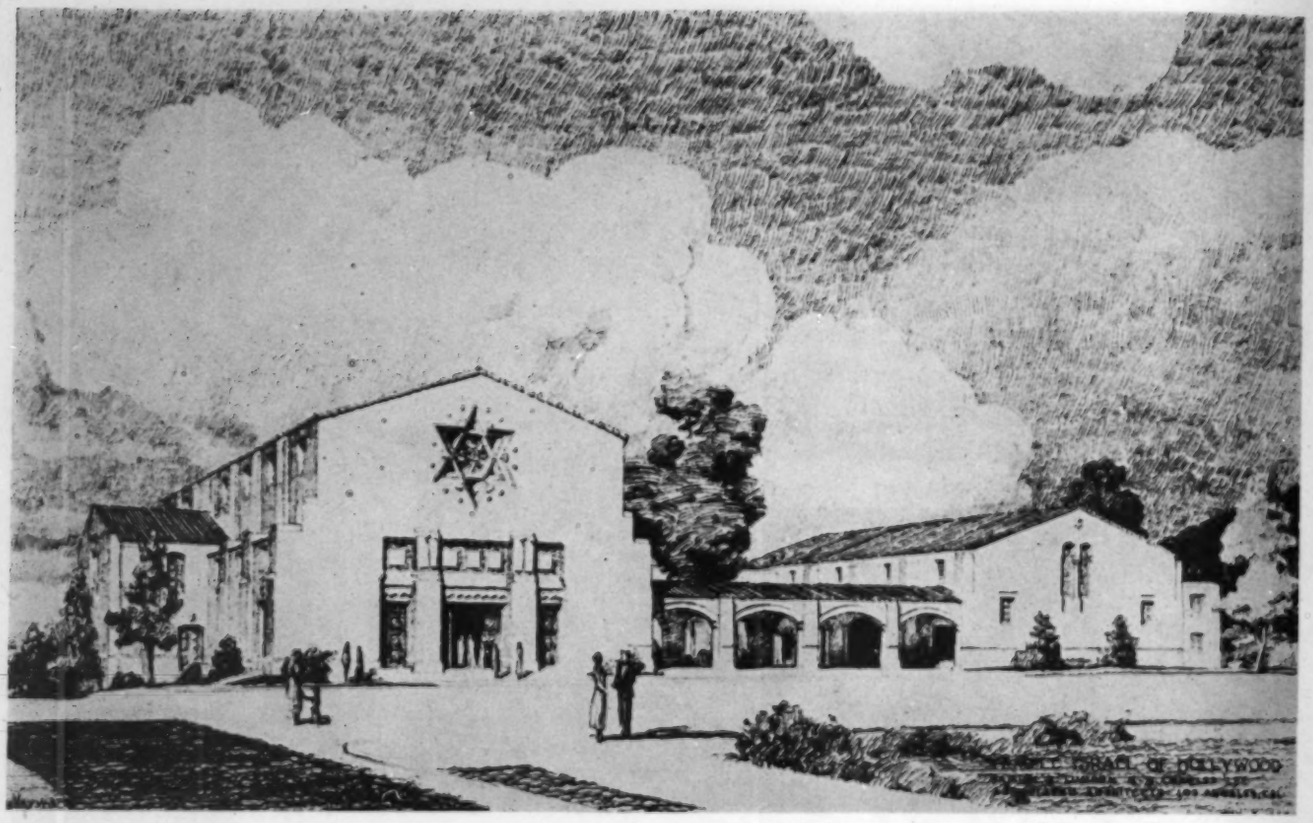
MAYNARD PARKER Photos

NEW CHARACTER IN OLD FRAMEWORK

Robert Stanton
Architect



EFFORT toward "vitalization" and a new approach to the sense of sanctuary and spiritual immediacy are evident in this remodeling of the Community Church at Carmel, Calif., to be called in its transformed character, "The Church of the Wayfarer." Moreover, the architect says, "It would have cost the congregation $25,000 to remove the old building (right) and erect a new one. We were able to remodel it for $17,000. New paneling and pulpit are of antique walnut purchased from an estate in southern California, having come originally from a Bourbon castle in Italy." The old pews were retained and treated to harmonize.

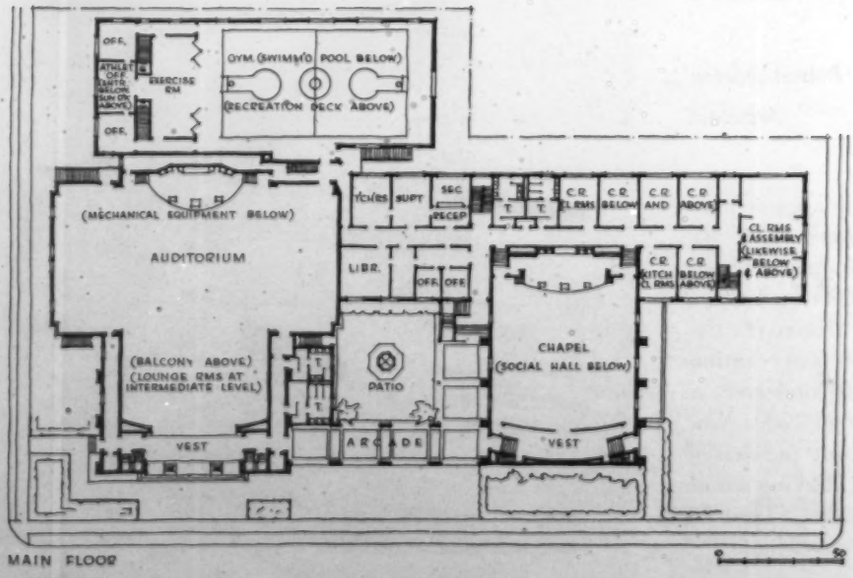


CALIFORNIA SYNAGOGUE IN MISSION TRADITION

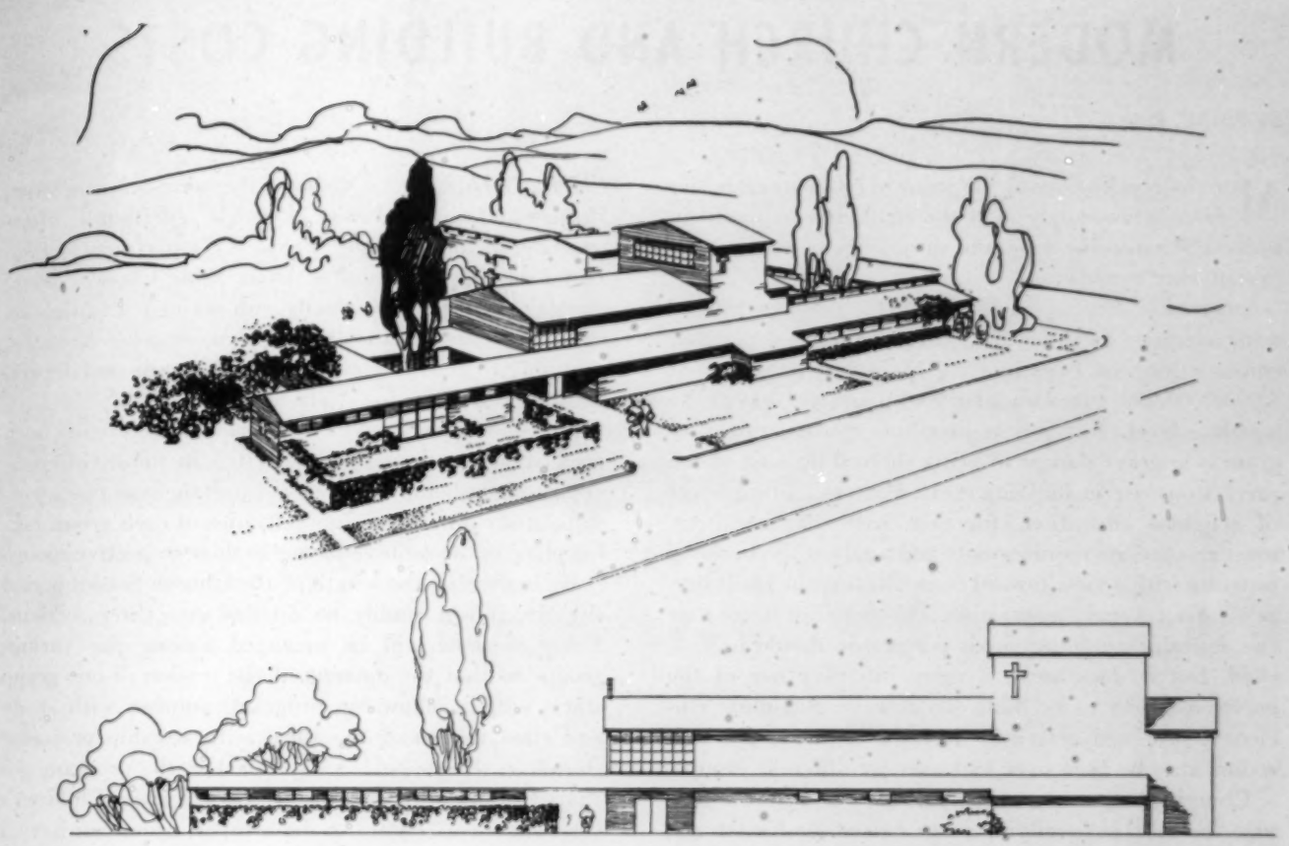
IN GENERAL appearance, Temple Israel of Hollywood indicates extension of previous tendencies into post-war stages. In the past, American synagogues have tended to conform with prevailing regional patterns of religious architecture. In this case, however, conformity with mission influence has stopped well short of a bell tower extraneous to essential tradition of this faith.

The plan provides generously for social and recreational activities, always paramount functional considerations in synagogue planning. Curvilinear seating is in line with standard practice for bringing congregations into close relationship with Ark and Alemar.

Samuel E. Lunden and S. Charles Lee
Architects



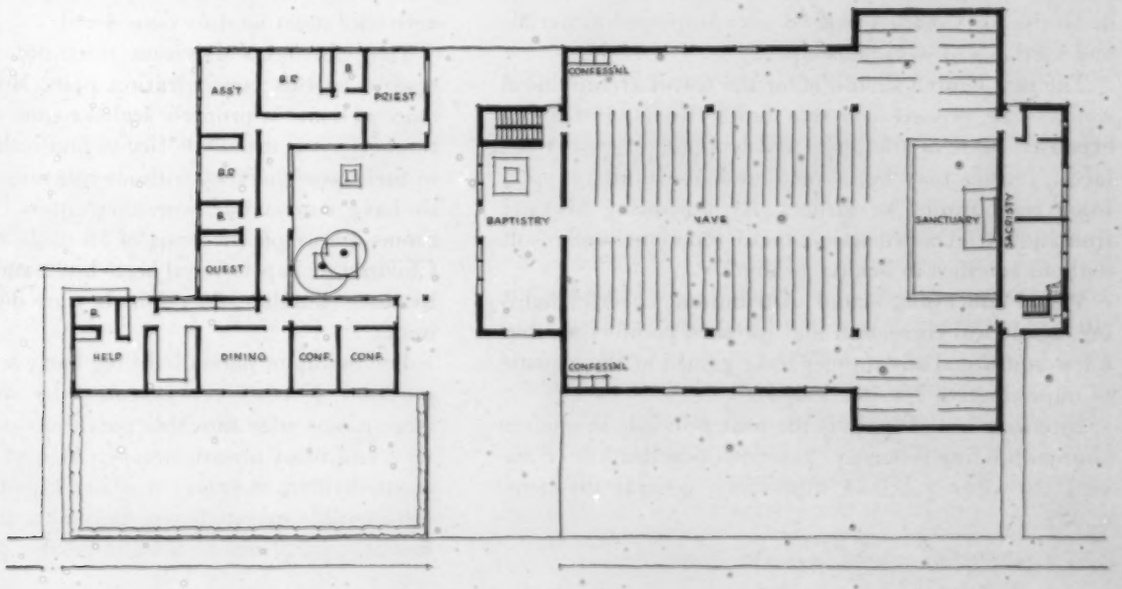
MAIN FLOOR



PAROCHIAL GROUP IN THE NORTHWEST

PAUL THIRY describes the general design of this proposed group of parochial structures, for a rural community near Seattle, as "contemporary, using as inspiration certain applicable techniques of the early missions of the Southwest." The first unit of the group will be church and rectory shown above in elevation and below in plan. Special features of the church are: extra wide side aisles for shrines, Stations of the Cross, etc.; large sacristies behind Sanctuary, with space above them for male choir; balcony over entry for mixed choir. Future units of the group will be an eight classroom school, social hall and teachers' residence.

Paul Thiry, Architect



MODERN CHURCH AND BUILDING COSTS

By Paul C. Ruth *

MODERN conceptions of the scope of religious activities force a new analysis of the structures expected to house the extensive program, in new terms recognizing present-day conditions.

So great is the movement to provide religious leaders with adequate facilities that the aggregate of planned construction was, even in 1944–45, estimated to exceed $3,000,000,000, based on labor and material costs at the wartime level. But this tremendous construction program is in grave danger of being shelved because of the precipitous rise in building costs. Pastors and directors of religious education, together with the architect, must re-examine requirements and analyze the building program with a view toward consolidating the plant into as compact a space as possible. This does not mean that the desirable minimum areas per person should be lessened, but it does mean a more intensive use of the enclosed spaces to be built. To achieve maximum efficiency, proposed activities must be so scheduled that rooms may be used over and over by different groups.

Church planners must more than ever before recognize the folly of specifying a nave sized for Easter and Christmas. Two services per year must not impose a 50 per cent increase in seating capacity over normal attendance. It is recognized that many pastors are desirous of large naves, for other reasons. Granting that their preaching is dynamic enough to fill the proposed structure, there is no assurance that such force will be perpetual or that the pastor may not be called to another charge. A far wiser plan is to have multiple services which, although increasing the preaching load, does not place the burden of an expensive and lightly used plant on the congregation.

The first step, undoubtedly, toward economical building is re-appraisement of architectural styles. "Archeological" types certainly are not economical to build. In order to have substance to their being, stylistic exercises in Gothic or Colonial depend on antiquated materials and methods of workmanship.

The new church should favor the use of architectural concrete or precast concrete units. Roofs, instead of expensive slate or tile, may well be built-up gravel surfaces. Trusses may be factory laminated units, or plywood rigid frames or girders. By borrowing liberally from industrial construction, many economies will result without sacrifice in beauty or dignity.

Visual education, sound distribution, cheerful lighting, acoustical correction and physical comfort are but a few additional advantages to be gained at the expense of unproductive "period designs."

Intensive use of space is the next principle in modern church building economy. Accepted practice has organized the church school into three general divisions: *Children's Division* — Nursery, Beginner-Kindergarten, Primary, Junior; *Young People's Division* — Intermediate, Senior, Young People's Department; *Adult Division* — Young Adults, Adult Bible Classes. These general divisions are usually sub-divided into departments as indicated, the over-all plan requiring divisional assembly rooms for worship and fellowship, and departmental classrooms for study and discussion.

Plans described above have generally heretofore been predicated on the various activities in the divisions or departments being carried on simultaneously; i.e., worship, study and fellowship activities of each group taking place in the same sequence in their respective rooms.

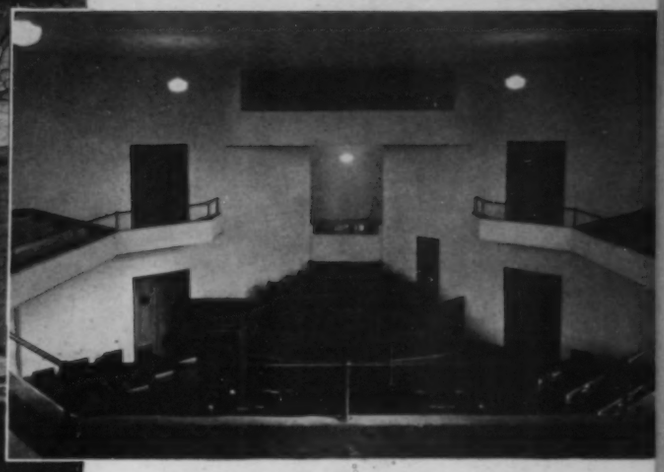
By increasing the length of the Church School period slightly, it can readily be divided into three sections. These sections will be arranged among the various groups so that the opening of the session of one group starts with a fellowship program, another with study and class work and the third with worship or junior church in the chapel. (A vital part of the program is a chapel suitable for worship services. In the Children's Division the assembly or department room can have a "worship center" readily convertible to secular purposes. In the Young People's and Adult Divisions, however, a real chapel is essential.) Allowing twenty minutes for each section and five minutes for change, the usual hour program is merely lengthened by ten or fifteen minutes. At the end of twenty minutes there is a rotation of the group to the next phase of the program, and twenty-five minutes later another rotation. This permits triple use of the same room with only one-third the size of the plant ordinarily required.

The architect adopting such a scheme must carefully check the routing of traffic at the change period. Traffic should flow naturally in one direction without crossing, requiring two means of entrance or egress from all rooms. In determining full space requirements, weekday activities must be duly considered.

The Children's Division does not adapt itself as readily to this concentration plan. Because they feel more at home in properly scaled rooms with small furniture, etc., it is usually better to house the small children in their own quarters, without rotation. It is also better to have convertible worship centers, and plan these rooms amply on the basis of 18 to 25 sq. ft. per pupil. Children's chapels have been built and are advocated by some church leaders, but they are definitely a luxury item.

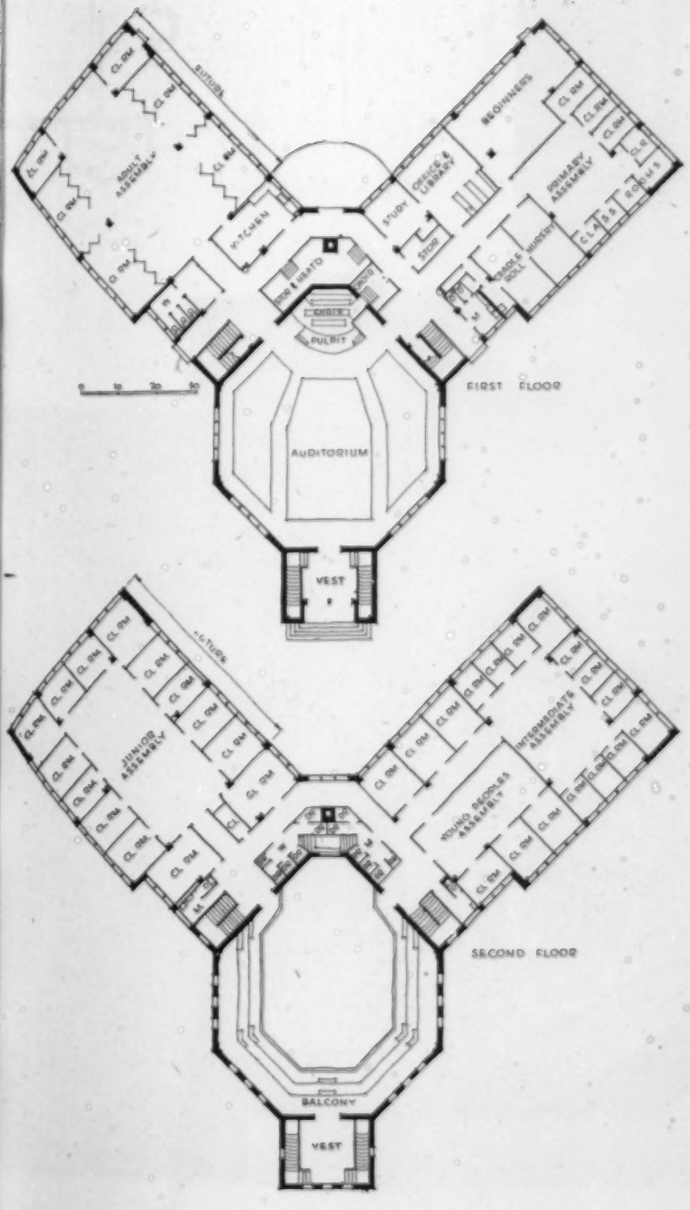
Fellowship or parish halls regularly serve a number of purposes. Further concentration by subdividing these large rooms with movable partitions or curtains is unwise and most unsatisfactory. At best they are inadequate dividers of space; they are expensive and require considerable maintenance. Only as a last resort should movable partitions be used in flexible planning.

* Of the architectural firm, Conrad, Hays, Simpson & Ruth, Cleveland, Ohio.



"POORBOYED" BAPTIST CHURCH

Arthur Fehr and Charles Granger, Architects



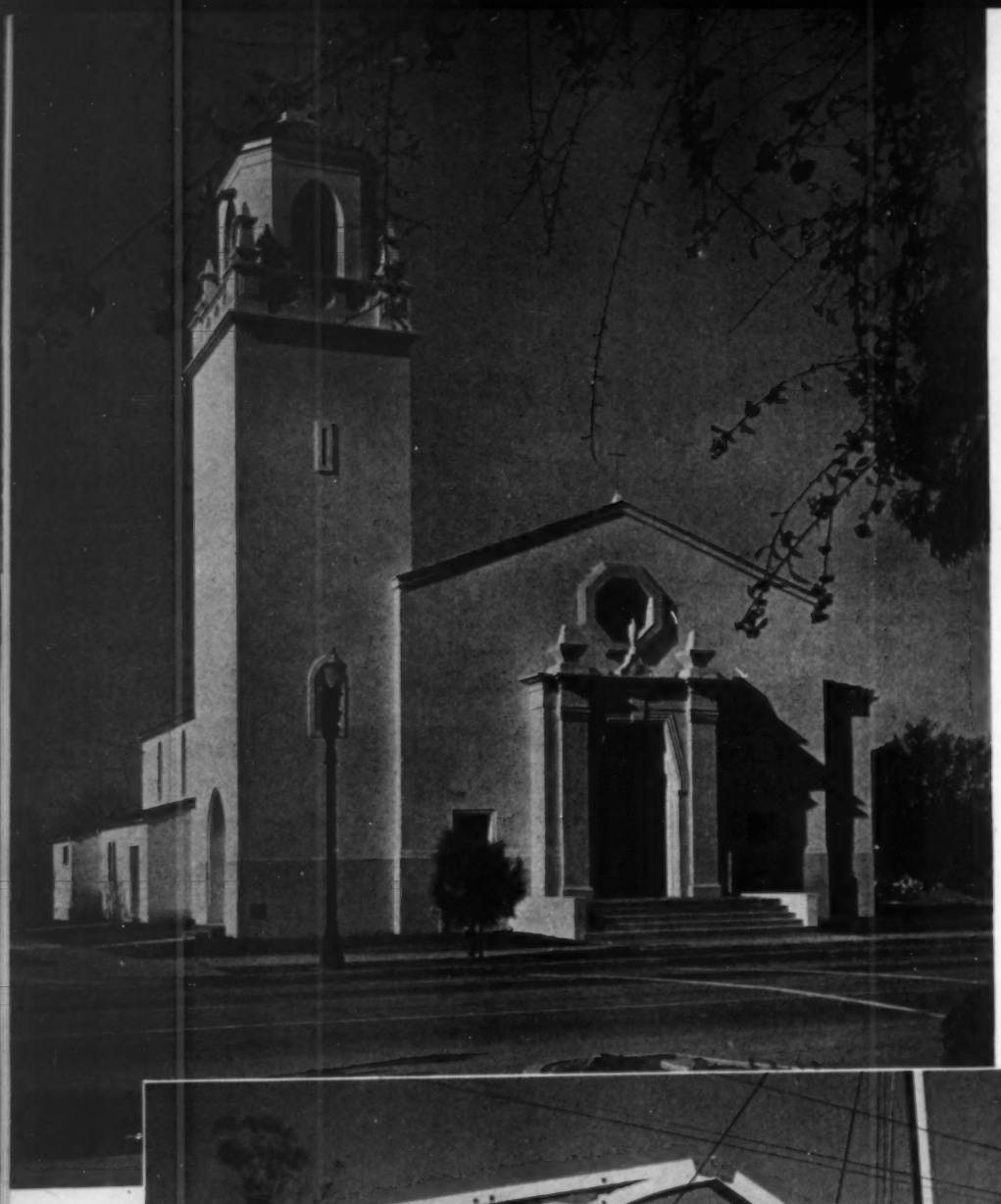
THIS congregation (Luling, Tex.) suffered a total fire loss," write the architects, "on Easter Sunday, 1939. Therefore in thinking of a new building they aimed at a maximum of fireproof quality, in addition to as much building as possible for their limited funds.

"After studying their requirements, we came up with the plan as shown. It was not too difficult to convince the church group that simple basic construction methods would result in a more economical and a more progressive architecture. Luling is a town of 4437 people and every other church in it is bastard Greek, Roman or Gothic 'inspiration.'

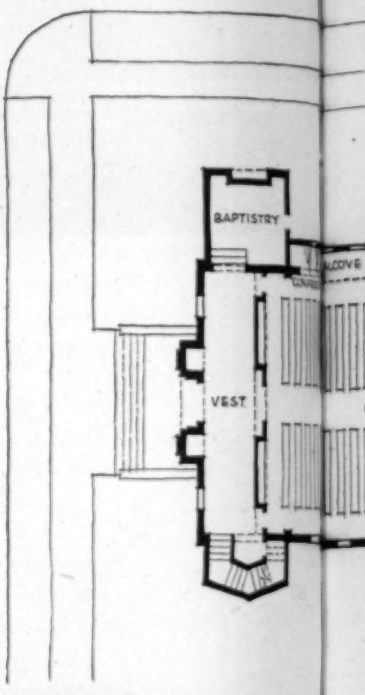
"This building was not built by general contract. On the first day after layouts were checked, the postmaster, banker, merchant, etc., had excavation holes assigned. In the main this procedure was followed throughout the entire construction. Every Tuesday was donated. On other days an unskilled labor group was hired at a nominal fee.

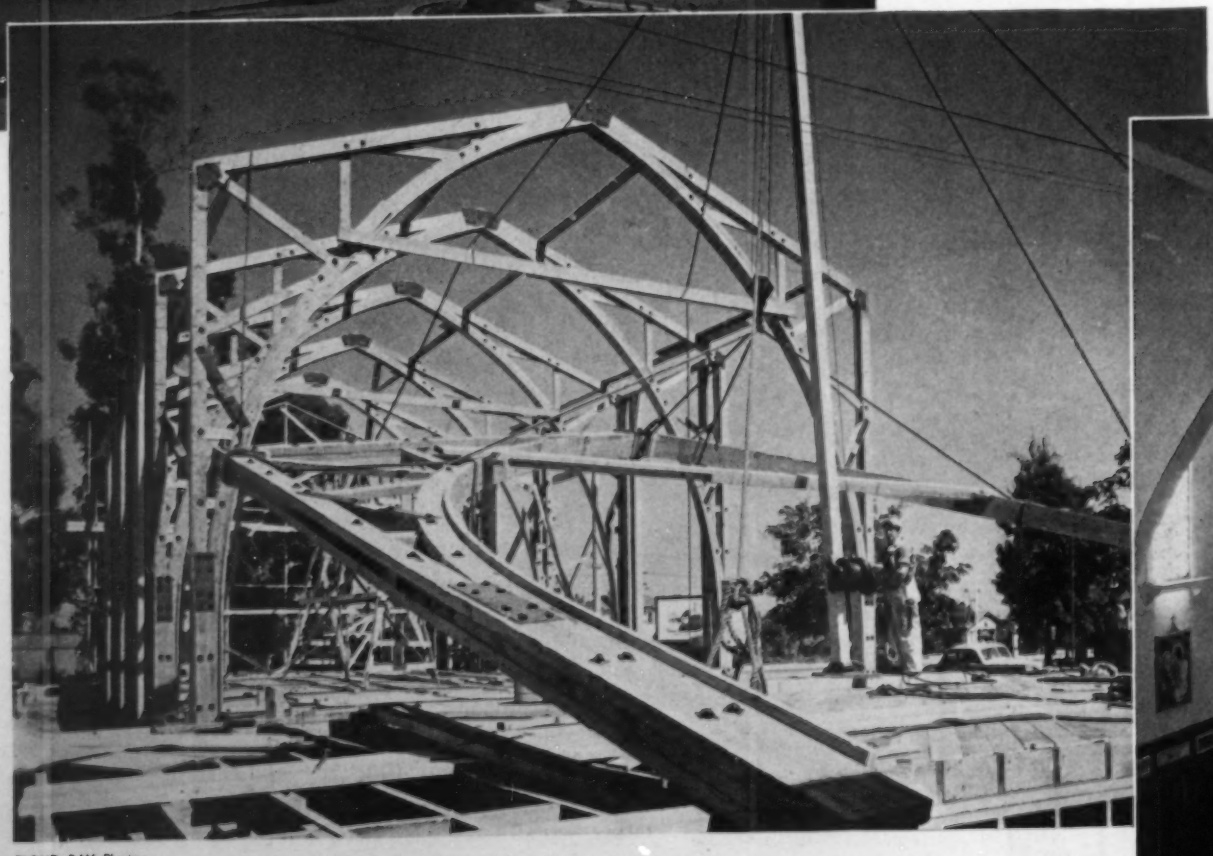
"The entire project was 'poorboyed' to achieve the most building cubage for the least expenditure of dollars and cents. Structural steel from abandoned oil derricks nearby was cut into new uses. Sucker rods were used as reinforcing bars. Commercial projected sash was used throughout in lieu of more 'ecclesiastical' and expensive fenestration. The bare simplicity of the auditorium is the outgrowth of the meager budget and the unskilled labor available for construction.

"At the present time the auditorium seating 400, with 150 additional in the balcony, and the south Sunday School wing have been erected at a total actual expenditure of approximately $30,000. The east wing is scheduled to be built at a later date."



A plot of limited depth necessitated narrowing of side aisles in the plan for St. Anne's to assist in giving an appearance of greater length to the nave, dimensions of which are 60 ft. at the transept by 112 ft. 5 in. Floor has straight incline slope toward Sanctuary of 2 inches in 10 ft.

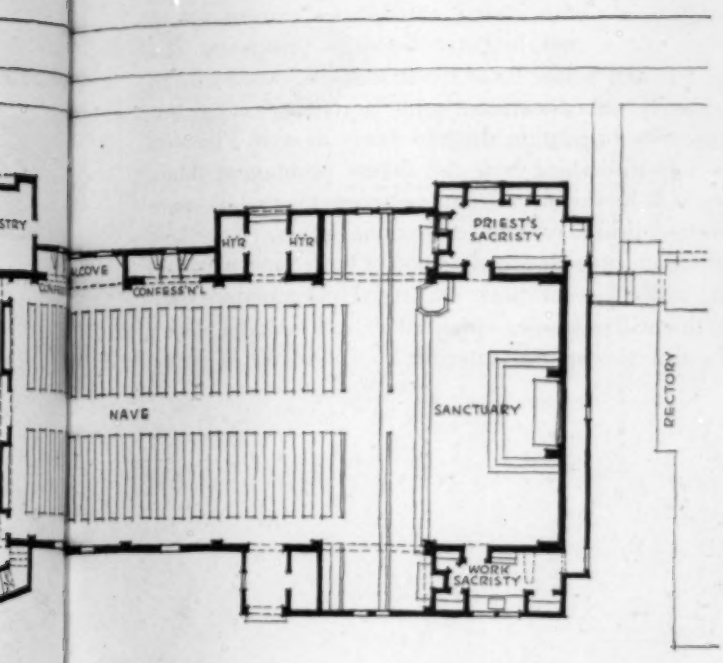




FLOYD RAY Photos

LAMINATED ARCHES FOR DIGNIFIED ECONOMY

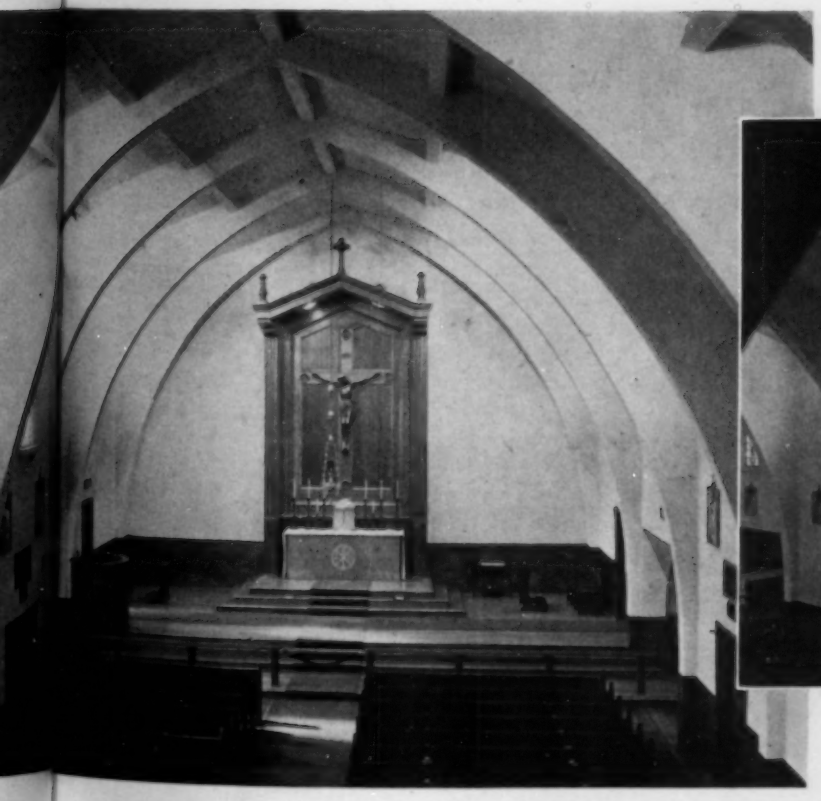
George J. Adams, Architect



PEACE, solace and a spirit of devotion" are objectives foremost in the mind of this architect when he sets himself to designing a church. In this case, for St. Anne's Parish (Catholic) in Santa Ana, Calif., it was necessary to try to attain them within strict budgetary limits.

Structural economy was achieved through the use of factory laminated arches, recommended by Paul C. Ruth (see page 106 of this study) as a means of cutting church building costs "without sacrifice in beauty or dignity." All members of the six three-hinge wooden arches were fabricated in the shop of Summerbell Roof Structures, Los Angeles, knocked down and delivered to the site, where each arch was assembled and erected as a complete unit. The lower truss chords are continuous glued members, using water-resistant casein glue according to standards of the Forest Products Laboratory.

In his treatment of the interior, the architect has allowed his structural principle to speak for itself, with the plastered-over trusses producing "repetitive forms usually associated with churches. The treatment of the nave was carried through to the back wall of the Sanctuary and over the choir loft above the vestibule, thus adding apparent length."



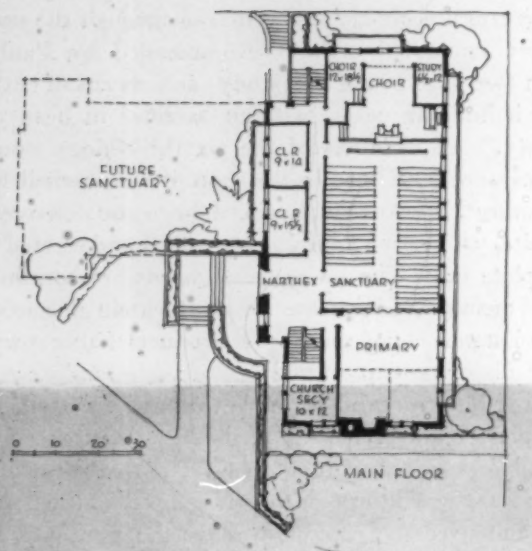
MILES BERNE Photos

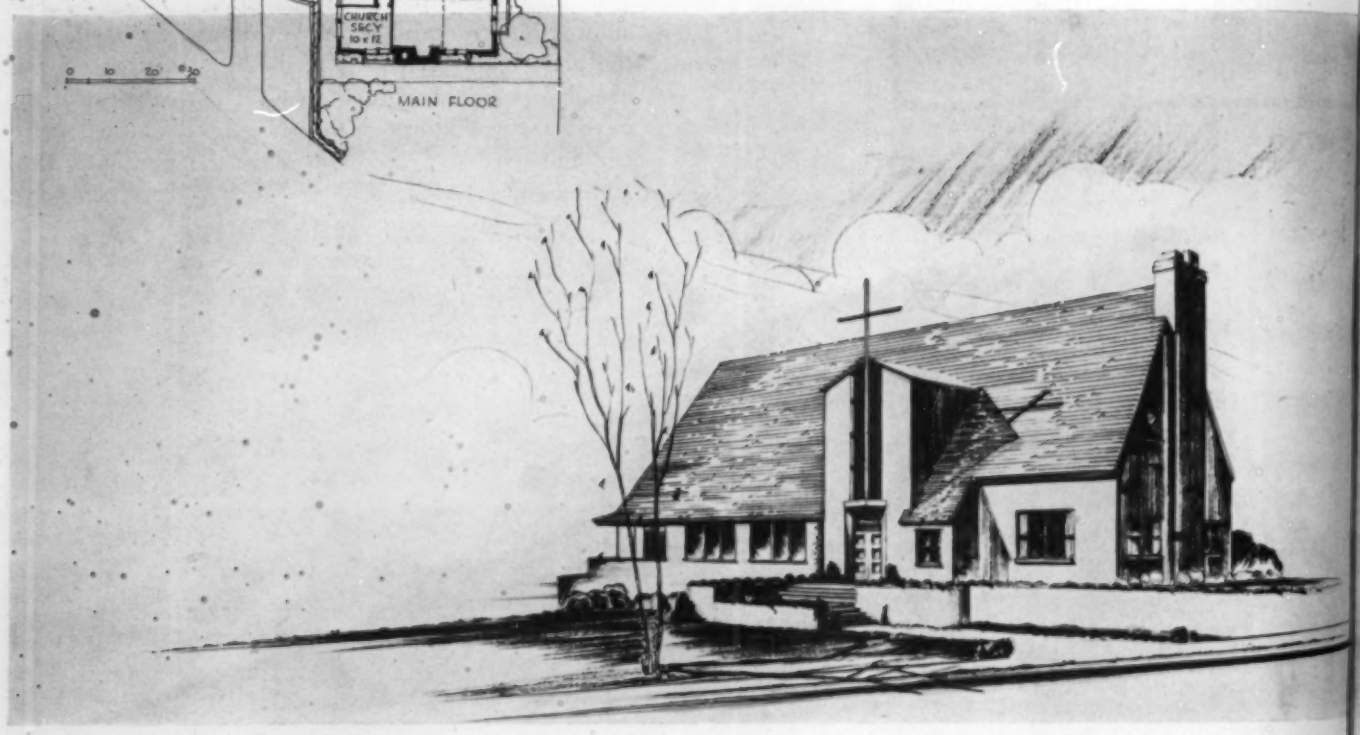
PROGRESSIVE PLAN FOR UNITED BRETHREN

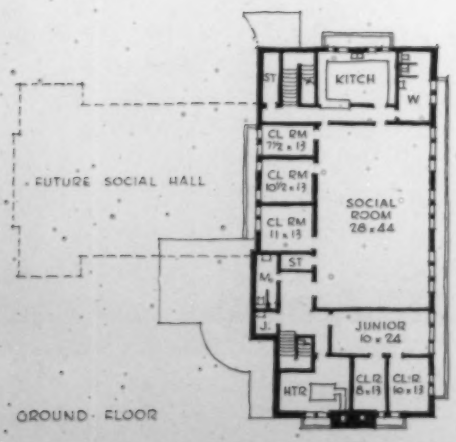
Naramore, Bain, Brady and Johanson

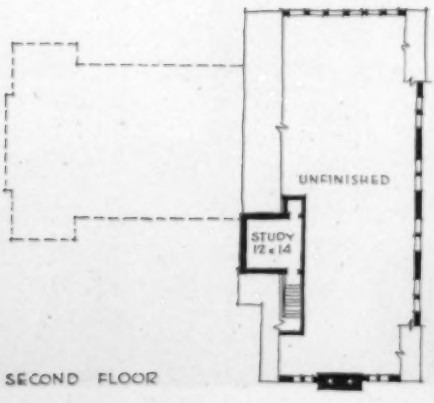
Architects

FOR "a gently rising triangular property bounded by three streets in a Seattle residential area," the architects have devised a plan to suit present conditions and parish means, with elastic capabilities toward future appropriations and brighter building prospects. The plans left and below show the first stage, eventually to be entirely an educational and "activities" wing, but temporarily to contain the Sanctuary as well. Plans on page opposite show how the future permanent Sanctuary will be developed and temporary worship space converted into class and recreational areas. (Note how future plans provide for extension of both Sanctuary and social hall to meet peak seating requirements.) Construction will be frame, with brick veneer outside; plaster and paint throughout interior; roof shingles of cedar.

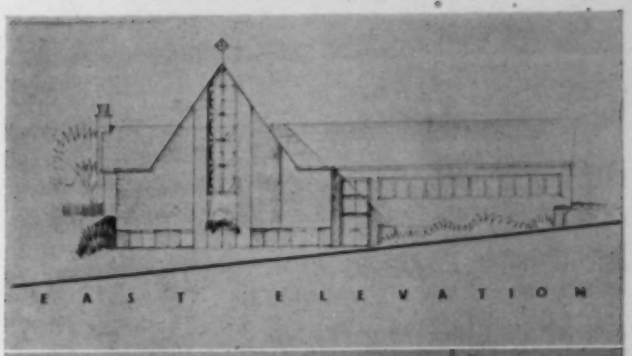


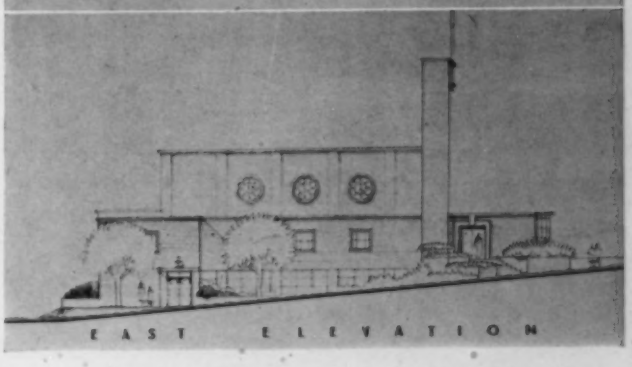


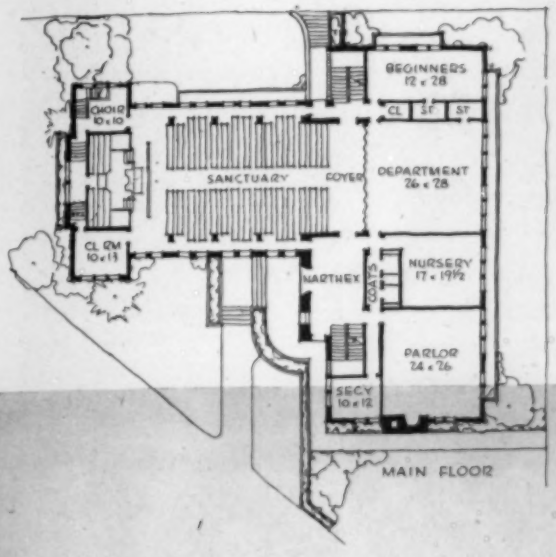


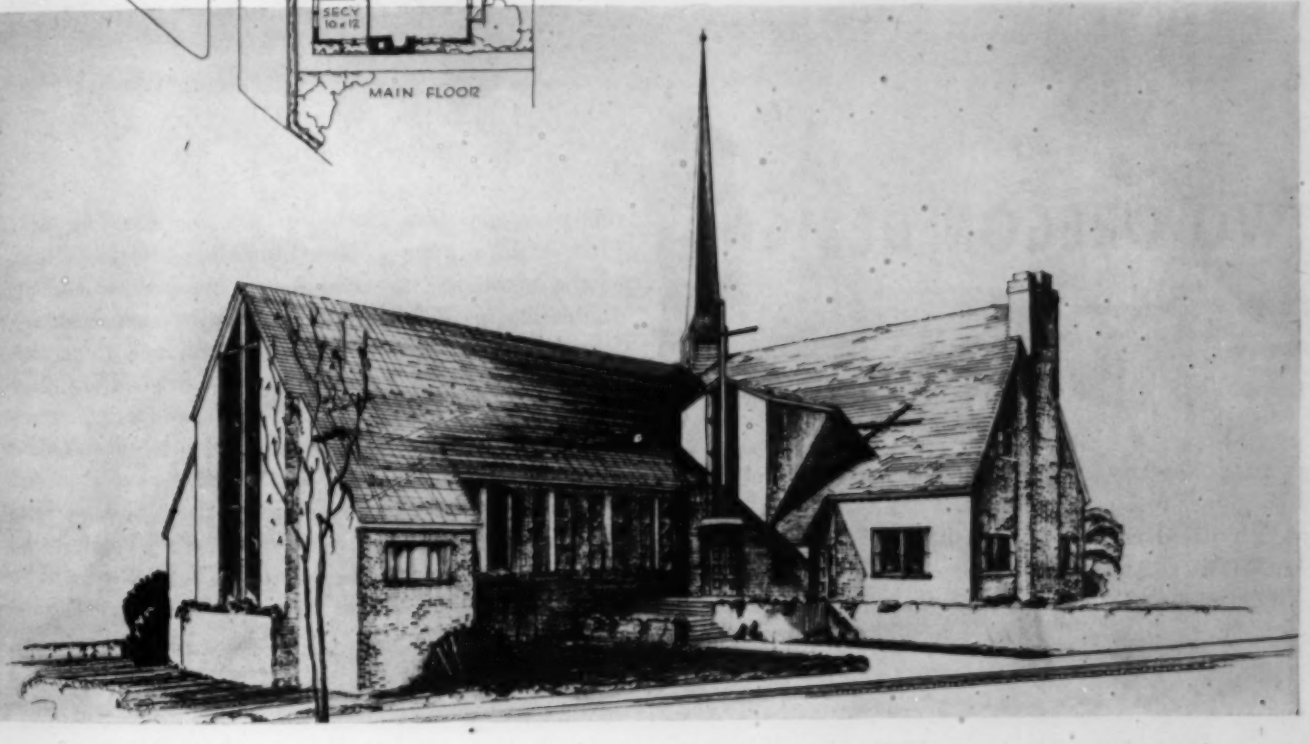


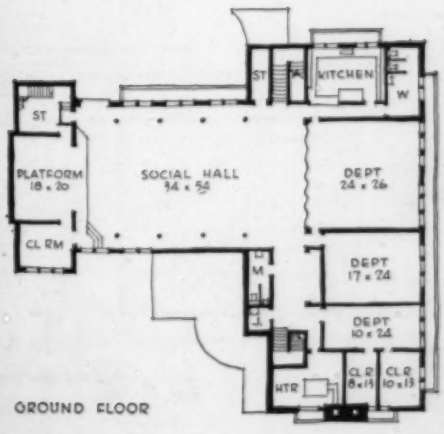
Elevation drawings (right) show two preliminary approaches to the problem, submitted to the building committee of the Greenlake Church of United Brethren in Christ. The architects were required "to restudy the problem in a somewhat more conventional feeling"

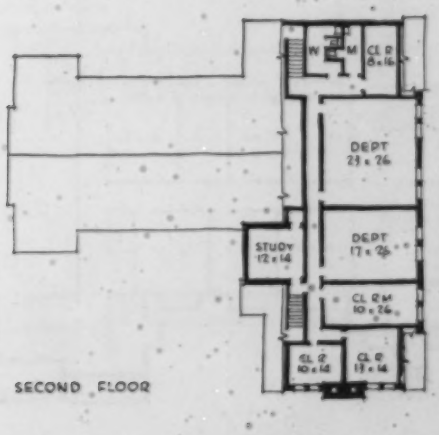










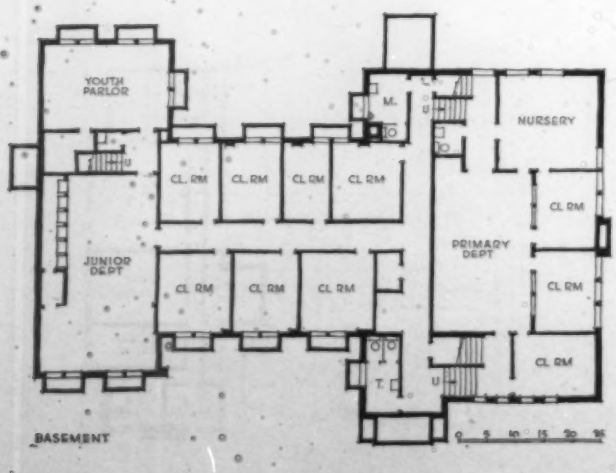


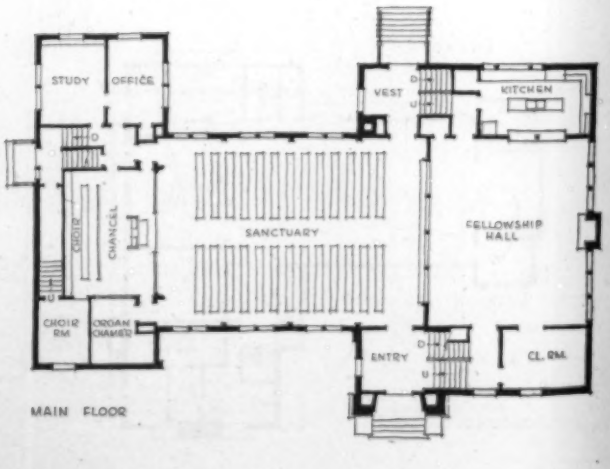
TWO OREGON DESIGNS

Donald W. Edmundson
Architect

IN THESE designs for suburban Portland, the architect continues to exercise a characteristic freshness of approach discernible in previously published work (see ARCHITECTURAL RECORD, September, 1945, p. 88).

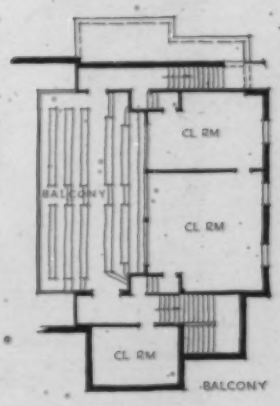
The plan for Mock's Crest Evangelical Church (on this page) provides seating in the sanctuary for 222. Floor of the adjoining fellowship hall is 4 ft. above that of the sanctuary, the two rooms being separated by double glassed openings normally to be curtained. Intentions are, at times of unusual attendance, to accommodate 50 to 60 additional persons, with good visibility of the chancel by opening the curtains and using microphones at the platform. When not required for overflow during services, the space will be used as a mothers' room. Elevation of the fellowship hall also permits floors of primary department and nursery below to be within 30 in. of the finished grade. Construction will be frame with veneer of split Roman brick, laid with ran-

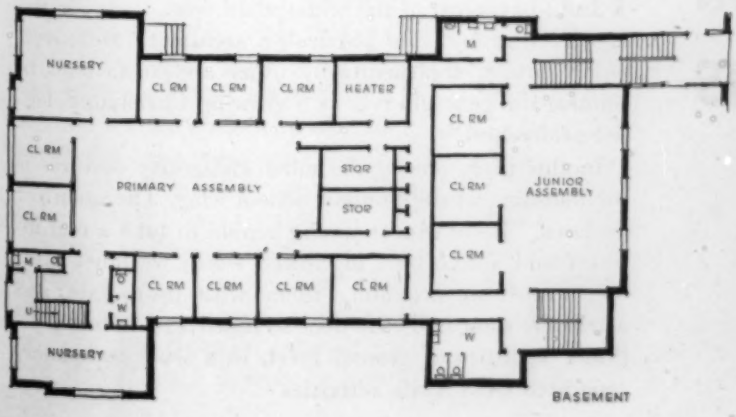


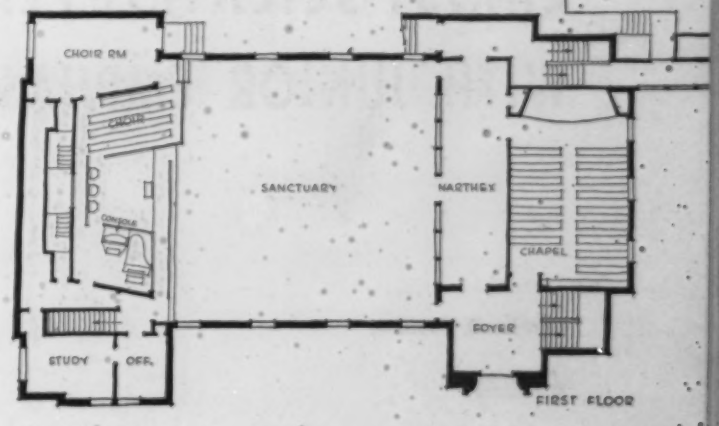


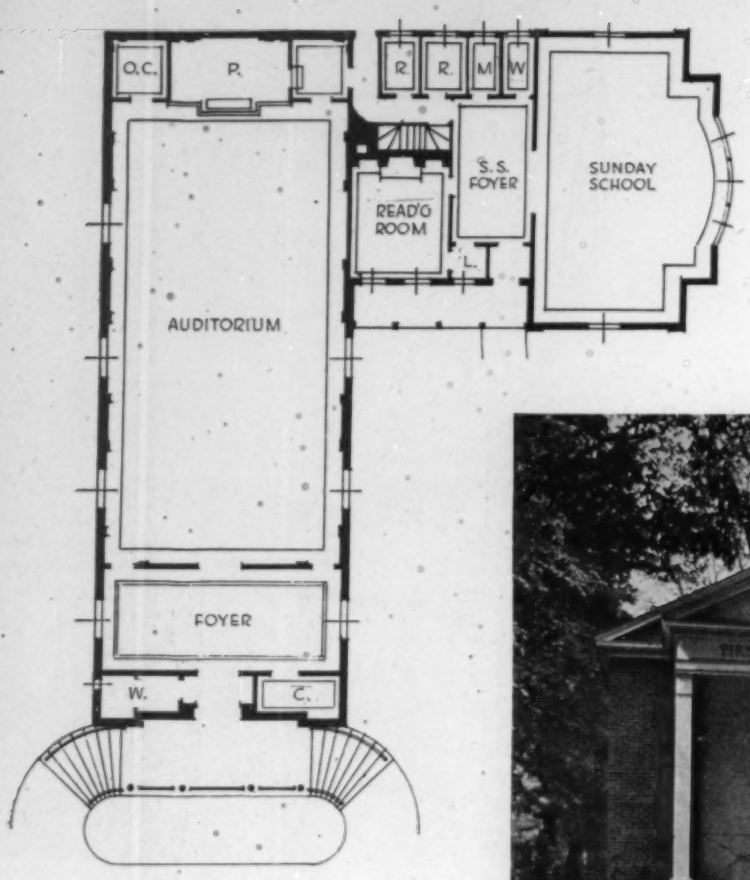
dom vertical joints. Cross motif in gables is accomplished by recessed slots.

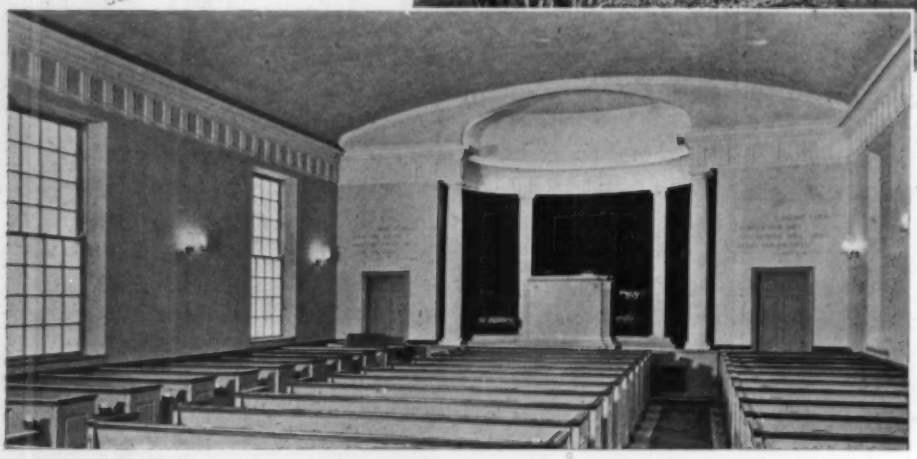
Sellwood Church of the Nazarene, shown on this page, is still in the process of preliminary development. The fellowship hall and related facilities (not shown in plans) will be in a separate wing to be connected by covered passageway with the main building. Space between will be landscaped as a sunken garden and used for outdoor meetings and social gatherings. Sanctuary will seat a total of 517; 374 on the main floor, 40 in the choir, 103 in the balcony. Small chapel at the rear of the building will seat 105. Floors of facilities in the basement are to be only slightly below the level of finished grades.











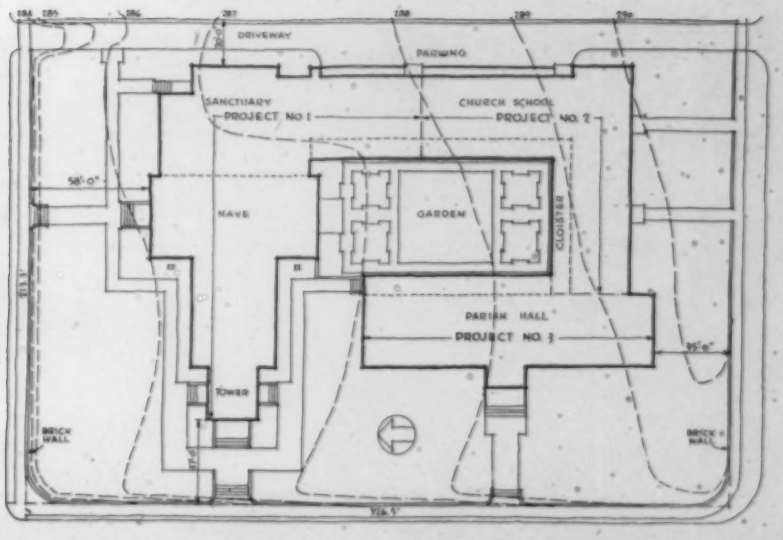
CHRIST SCIENTIST PLAN WITH JUNIOR EMPHASIS

Charles D. Faulkner

Architect

THIS First Church of Christ Scientist, at Valparaiso, Ind., is typical of the widespread work done for the organization by this particular architect. Moreover, recent similar treatments by other architects tend to confirm the general style as a growing Christian Scientist preference.

In this plan, one of the most distinctive features is the handling of the Sunday School wing. The architect declares: "If we expect young people to take a real interest and active part in church work, we must exert our utmost in providing them with up-to-date and attractive quarters." He does so himself by housing the junior facilities at ground level, in a wing completely separated from adult activities



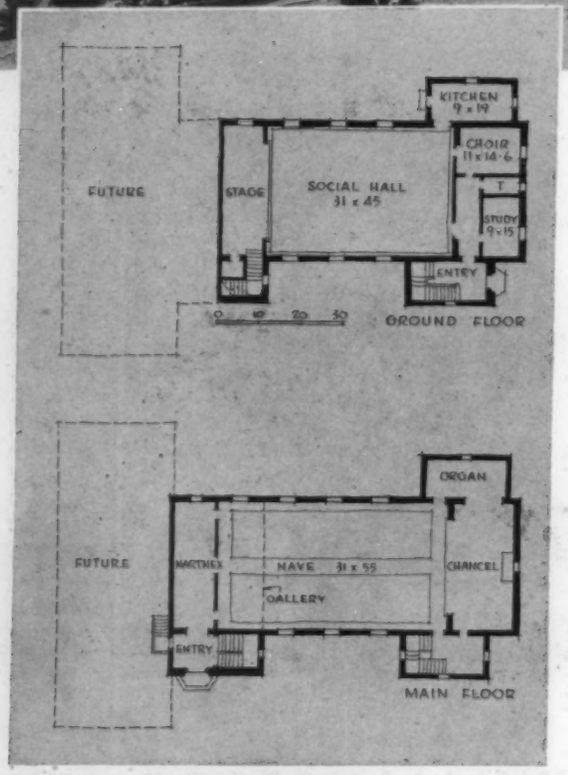
WILLIAMSBURG STYLE IN THE DEEP SOUTH

BY DEMAND of the parish," the architects write, the exterior of St. John's Episcopal Church, to be built in Memphis, "is similar to that of Bruton Parish Church at Williamsburg, Virginia. St. John's, however, will be much larger, with a seating capacity of 500. Also, the interior is more elaborate, in keeping with Episcopalian ritual, requiring an amount of symbolism which we have incorporated in wood carving on the chancel screen, pulpit, lecturn, and reredos."

The total project will be built at a cost of $500,000, in three stages as shown in the plot plan. Exterior walls will be brick bearing; roof rafters and trusses, steel; asbestos roof shingles. Interior walls will be plastered and painted, with frescoes in Baptistry and Chapel.

Dent & Ayedelott

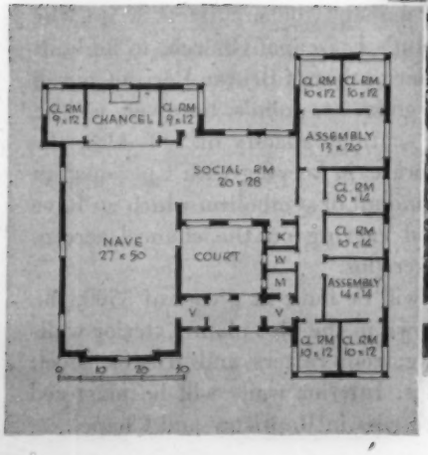
Architects



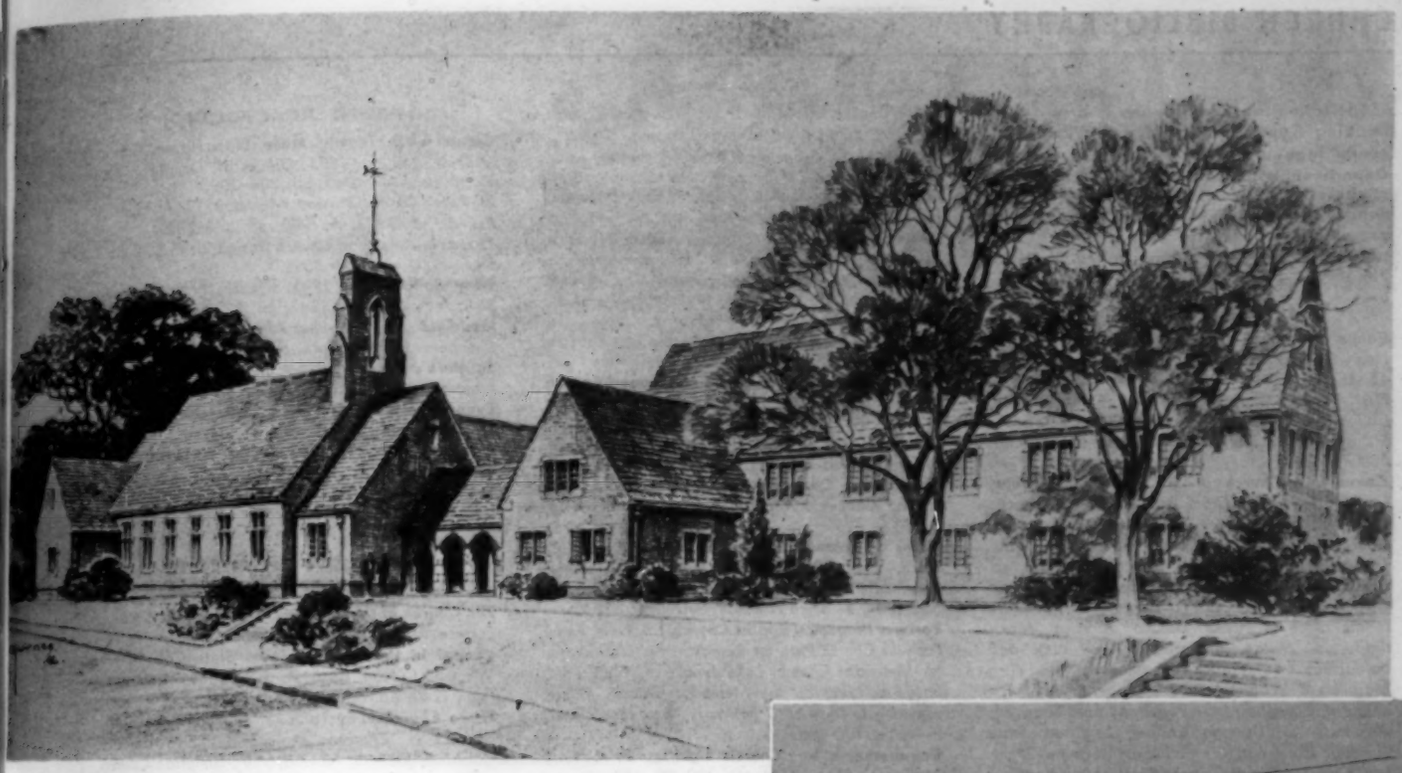
THREE SOUTHERN CHURCHES

Barber & McMurry, Architects

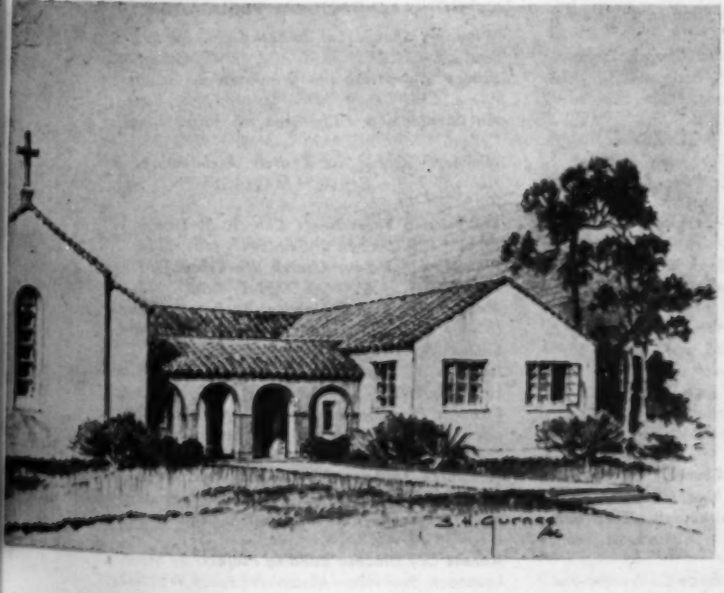
THESE three latest examples from an architectural firm, famously active and successful in adapting the form of the church to the solid conservatism of small southern communities, tend to imply a formula pro-

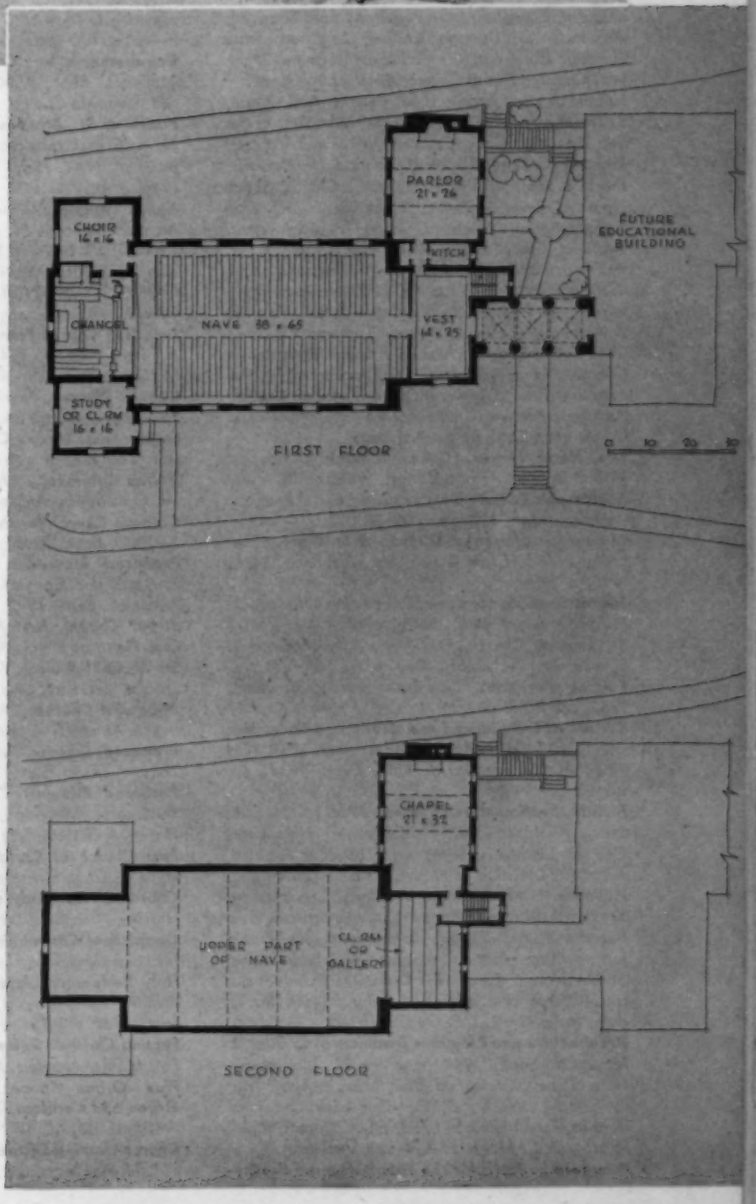


Plan for First Methodist Church at Clewiston, Fla. (right), shows solution of the peak attendance problem — a social hall that may be utilized for supplementary congregational seating at Christmas time and Easter



cessively discernible in previous RECORD church studies (see work of Barber & McMurry in issues of September '44 and '45). In the Methodist churches for Bristol, Tenn. (across page) and Canton, N. C. (above), the architects' usually direct approach to interior function, and their respect for client preferences regarding the exterior, have resulted in designs that are unmistakably characteristic. In each case the treatment of the tower amounts practically to a signature. In the small church for Clewiston, Fla., below, they show themselves equally at home in expressing the influences of mission tradition.





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ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

THE BETTER WALL IS COMING

By Robert L. Davison*

THE PROBLEM: *It is now financially impossible for the average man to buy, build, or rent a new four-room apartment or home.*

THE SOLUTION: *"The real solution probably lies in some radical departure in house construction and economics, as it does not appear to us that we are likely to have such relative readjustments as will correct this situation."*

SOUNDS like 1946. But this was the introduction to an article I wrote for ARCHITECTURAL RECORD in October, 1929. The quotation is a statement by Herbert Hoover, when he was Secretary of Commerce.

It is surprising how little technical progress has been made in the intervening years. The evolutionary advance has been slow. Right now there is considerable promise that technical practice and manufacturing enterprise may catch up with the ideas and principles that were already evident in 1929. Again there is a strong urge in the economic situation in housing; there is a shortage of normal building materials, as well as of houses and apartments. And there is the wartime technology, which has given us not only a galaxy of new materials and techniques to adapt to building, but also a more favorable attitude toward scientific potentials.

The 1929 article had much to say about the possibility of a new wall material, something lighter, better insulated, less bulky than the conventional masonry wall. It outlined a concept of scientific research in materials and techniques which would visualize an ideal and work toward it, rather than the more conventional approach of starting with available materials and trying to develop them. Through all the years the latter has continued to be the typical approach, but the building industry now has so many new materials arrayed before it that it should not prove difficult to get pretty close to the ideal thing. Currently there are many attempts to be revolutionary instead of evolutionary about the whole technology of housing, and they may or may not succeed. But certainly it should be possible to go at least as far as a better wall.

And how badly we need it right now! The veterans' housing program has bogged down; it begins to look like years rather than months before even the emergency part of the housing shortage will be overcome. There are simply not enough conventional materials and equipment being produced. Costs are high. There is need for every new material and money-saving method that technical ingenuity can concoct. If a new wall system would help in rental housing, the veterans would be especially thankful.

NEW MATERIALS AND RENTAL HOUSING

The multi-family rental housing field is the logical place to introduce a radically new wall material. Assume that a wall composed of insulating material, covered with copper, stainless steel or aluminum, "papreg" or "compreg," were developed at a prewar cost of 75 cents per sq. ft., finished. It would cost 25 per cent more than the standard frame construction of single-family houses, but approximately 50 per cent less than the conventional apartment house wall. Therefore, there is no direct price incentive to use the new type wall in single-family housing, but a great price incentive in multi-family dwellings, not only because of its lower initial cost, as compared to a traditional wall, but due also to its being only 2 to 3 in. thick instead of 10 to 12 in. thick. This provides an additional rentable floor area which will give a net profit of $1.00 or $1.50 per lineal foot of wall per floor per year.

And in apartment construction economics tend to lift the clay feet of traditionalism. The builder is interested in financial return, not in a cozy retreat from the machine age. To many home owners a metal-clad wall would be acceptable only if made to resemble clapboards. The apartment dweller would be less concerned with conservatism. The builder could accept the money- and space-saving advantages without worrying much about tradition.

This of course does not mean that the new materials will never be used widely in single-family houses. With their perfection and quantity in apartment use, their cost will be reduced. And in time the simplicity, ready availability and other advantages of these newer construction materials will lead to their forthright acceptance in single houses.

The drawings on p. 121, which were taken from the 1929 article, illustrate the lighter wall problem possibilities of the apartment house perfectly well for today. The weight comparisons shown can be improved upon today, for the newer insulating materials are surprisingly light. Now, how far have we progressed toward realizing this goal?

DEVELOPMENT OF NEW MATERIALS

Right now the building field is witnessing a hectic scramble to improve existing materials and methods, and to develop or adapt newer ones to building uses. It is a competitive scramble, and a de-

*Robert L. Davison Associates Housing Research

tached scientist might be pardoned for complaining that today's research might be more scientific — scientific in the sense of being free to discard all competitive considerations and go searching for the technical ideal.

A factor in the immediate present is that all established companies can sell everything they can possibly make. And they do not have materials for something new and better, even if the true scientific research had been done and the ideal combination arrived at. Meanwhile the rush is on for new building; architects and builders cannot wait for development, tests and trials. Nevertheless, study is going forward, and in the light of present conditions it is not surprising if it all does not hatch immediately.

Meanwhile, however, there are new materials and new manufacturers coming into the field of building, in a process of reconversion of wartime developments. Two or three years ago we heard the definition of postwar planning as "figuring how we can get into the other fellow's business." If this type of planning has not been found too easy, at least there is plenty of it being attempted, and many of the new materials will enter building via this route.

For instance, there are the developers of lightweight materials which might now be used as the insulating core of structural laminates, which are suitable for all types of enclosure purposes, such as exterior walls, floors, roofs, and partitions. There are the metal manufacturers or fabricators, whose products could be used as the denser skin of the core material, such as non-ferrous metal, stainless steel, or plastic-coated ferrous material; or the plastics manufacturers who can provide a plastic impregnated fiber for surfaces. In the field of equipment it is possible that financial interests back of some of the war aviation industries may develop radically new assemblies for the mechanical needs of the house.

Prefabrication has been a confusing element. When anyone speaks of the house of the future, many people think of the "prefabricated house." They have heard of such houses being produced on the assembly line at a prodigious rate for war use and may have read of the erection team which, in a race, had its house up, the water turned on, and a publicity girl in the tub, all in less than an hour.

Current prefabrication is, generally speaking, an attempt to do the old job better, not to do a new job. The houses are fabricated faster and in larger quantity with some improvements, but they are essentially the old house. A better term for these houses would be "partially pre-assembled." Most of the redesigning that has been done has been in the interest of fitting the house for a changeover from handicraft assembly to quantity production assembly. It is evolutionary and it is progress, but is not necessarily scientific progress. By evolutionary methods one could keep on breeding horses until kingdom-come; one might get slightly faster transportation by horse and buggy, but one would never get an automobile.

The energetic study of prefabrication that has become so widespread is not to be disdained. But it is not truly scientific in the sense mentioned before, and it has too many problems in too many directions to help very far in the search for the best materials.

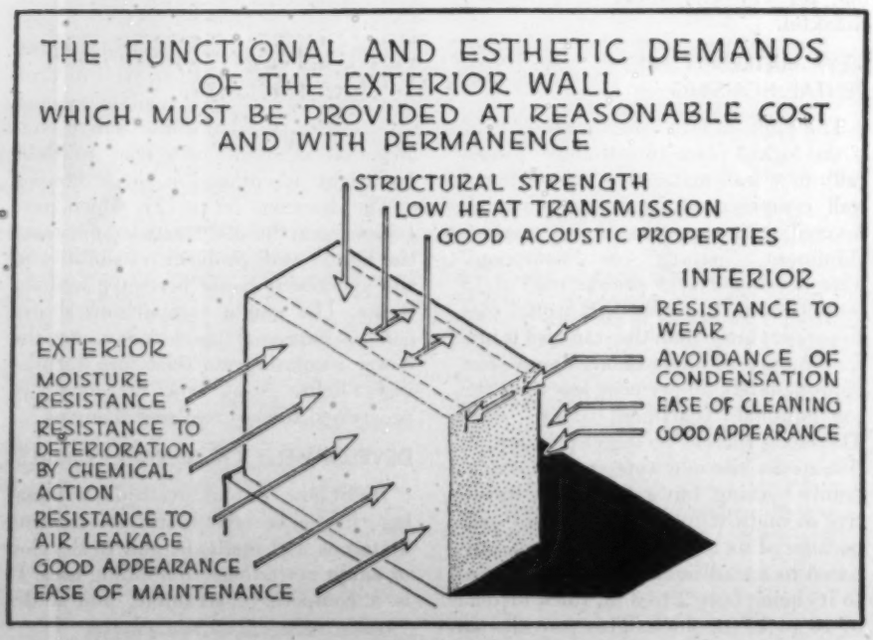
What we need is a processed wall, rather than merely a prefabricated one. A plate glass store front is an example of a processed wall material which is not merely an imitation of masonry or frame construction but by itself is the wall. One can visualize the development of a material which might perform the functions of a nontransparent wall as well as glass performs the functions of a transparent wall, and might be as universally used.

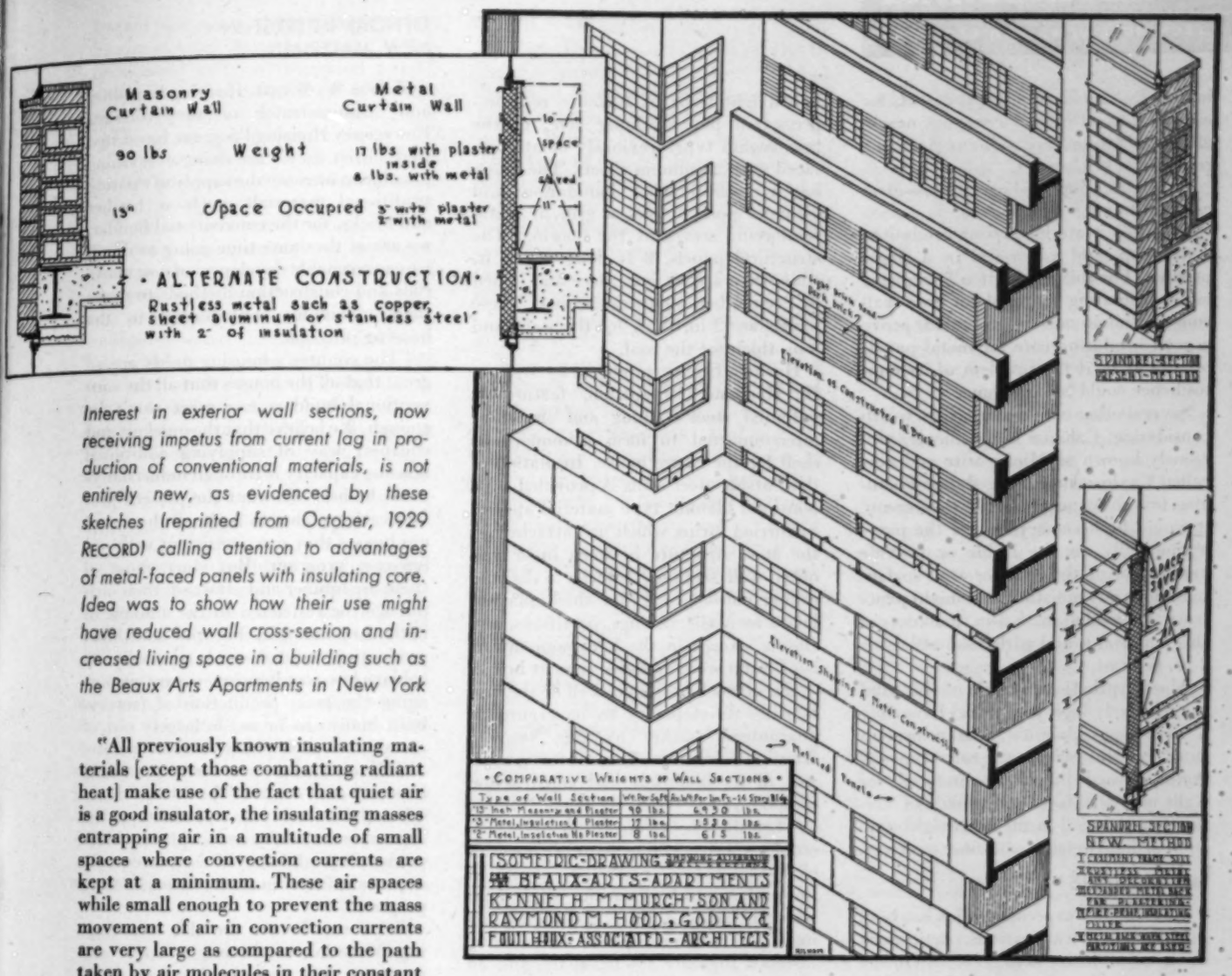
An interesting though largely hypothetical advance toward the discovery of such a material was the scientific investigation of Professor J. D. Bernal, head of housing research for the British Government. Professor Bernal decided to discard present ideas of materials entirely and start with a new approach: the formulation of a theoretically ideal wall material. He asked himself: "What molecular structure would make the ideal exterior wall?" and decided upon a crystalline structure that would have no cleavage planes between groups of atoms (leading to fracture), and that would be "transparent" to high-temperature radiation from the sun (letting its warmth through) and "opaque" to heat from comparatively low temperature sources (holding in the heat generated inside the building). Further qualities considered desirable were light weight, high tensile strength, and elasticity. He discovered a crystalline form, closely approximating this ideal substance, in the joint of bamboo, concerning which he remarked:

"The aerogels which are found in certain plant products, notably the pith of bamboo, can now be made in the laboratory as hard solids several times lighter than cork and practically perfect insulators against heat. They also have the incidental advantage of being completely fireproof. If such material could be produced on a large scale, then walls and partitions could be made from slabs weighing about one pound per square foot." Present walls weigh about 10 pounds per sq. ft. for wood-frame; up to 150 lb. or more for masonry.

A substance that is relatively near to Bernal's ideal in some characteristics is Santocel, a material that was developed by Monsanto Chemical Company. This is a silica aerogel, described by the manufacturer as "a very light porous form of silica, having an apparent density of 8.0 to 8.5 lb. per cu. ft."

It also is said to be one of the best heat insulators known. "Resistance to the flow of heat through its mass is the most startling of the novel characteristics of Santocel, since its resistance is greater than was believed theoretically possible. Prior to the discovery of Santocel, the best heat insulator [aside from a vacuum] was a space containing 'still air.' This was theoretical and could be arrived at only by calculation, since heretofore it has been impossible to prevent air within a space from moving either in a mass (convection currents) or molecularly and this movement destroys [reduces] insulating value of air space.





Interest in exterior wall sections, now receiving impetus from current lag in production of conventional materials, is not entirely new, as evidenced by these sketches (reprinted from October, 1929 RECORD) calling attention to advantages of metal-faced panels with insulating core. Idea was to show how their use might have reduced wall cross-section and increased living space in a building such as the Beaux Arts Apartments in New York

"All previously known insulating materials [except those combatting radiant heat] make use of the fact that quiet air is a good insulator, the insulating masses entrapping air in a multitude of small spaces where convection currents are kept at a minimum. These air spaces while small enough to prevent the mass movement of air in convection currents are very large as compared to the path taken by air molecules in their constant vibration. As long as air molecules can move freely they will conduct heat effectively."

At present, this material is too expensive to use as a curtain wall for enclosing dwelling space. Its commercial use will probably, for the first few years, be confined to insulating refrigerators. If it ever becomes available for housing, it should be possible to have a 1-in. thick wall which would have an insulating effect more than twice that of a 12-in masonry wall. While this decrease in heat loss from the wall of a building would amount only to 2 to 3 cents per sq. ft. of wall per year, the increase in comfort and the rapidity with which buildings could be heated in the morning would have considerable advantage.

Celotex Corporation is reportedly improving its Cemesto board, which has been used extensively in war housing for both single-family houses and dormitories. All necessary components — exterior weather surface, insulation, and interior finished wall surface are integrated into a single structural board, which is made up of an insulation board core veneered in manufacture with a ⅛-in. sheet of asbestos-cement on both faces. For exterior walls, a board with a 1½-in. insulation core is used; for inner partitions, the insulation core is ½ in.

Honeycomb laminated panels have been developed by United States Plywood Corporation and the Glenn L. Martin Company, in which a lightweight core material, resembling a honeycomb in appearance, is sandwiched between and firmly bonded to two facing materials or "skins." The core or "honeycomb" may be made of paper, paper cloth, fiberglas, or fabric, impregnated before the core is formed with a phenolic resin. The weight of this core may be as little as 4 lb. per cu. ft., depending upon the material used. The surface material or "skin" may be wood veneer, plywood, aluminum alloys, stainless steel, or plastic sheets of any thickness, and firmly bonded to the thin edges of the honeycomb core by a plastic thermosetting adhesive.

These honeycomb laminated panels were originally developed for plane floors and bulkheads during the war, but the manufacturers expect that it will soon be available for use as wall panels in building construction. At present they are available in flat sheets only, custom-built to specification, but manufacturing techniques are now being studied for making possible the fabrication of curved surfaces.

There are various foam plastics which excite interest and may be used extensively some day as core material for metal wall units. Their advantage lies in their high insulating value, elasticity, and light weight, which provides ease in transporting and installing, but many possess a disadvantage in lack of fire-resistance, which could be provided to a degree by metal surfaces. Price per pound is still high, but is expected to decrease. When their light weight is taken into consideration (3 to 6 lb. per cu. ft.), and also the fact that less than ¼ cu. ft. is needed for a square foot of wall, a cost of 20 to 30 cents per pound is not prohibitive. A price of 10 cents per pound might permit use of these panels in single-family houses.

At this time we have not discovered any insulating core material and surface

material which meet all requirements for a wall material 100 per cent, but nearly all combinations are superior in some respects to brick walls.

Foamglas, composed of countless glass cells containing sealed-in air, is a non-combustible material offering insulation, water-stop, and vapor-seal in a single product. For this reason it is being used as an insulating material for core wall construction in masonry. It might prove a good insulating core for metal panels or wallboard if the problem of its non-resilience could be overcome.

Several other core materials are worth considering. Calcium hydrosilicate, previously known as Microporite and now called Kaylo, is more rugged than Foamglas, but not vaporproof. For this reason, it would be necessary to seal the panel hermetically on the inside or provide ventilation of the exterior wall surface to remove any moisture that might penetrate the insulation. A 3-in. thickness of this material would withstand at least a 2-hr. fire test.

Most synthetic materials of this kind are relatively high priced and have only a limited availability at the present time. For this reason, the early types of metal-encased insulating material for walls may well have cores made of Vermiculite in board form, lightweight gypsum, or lightweight foam-fiber concrete.

METAL PANELS

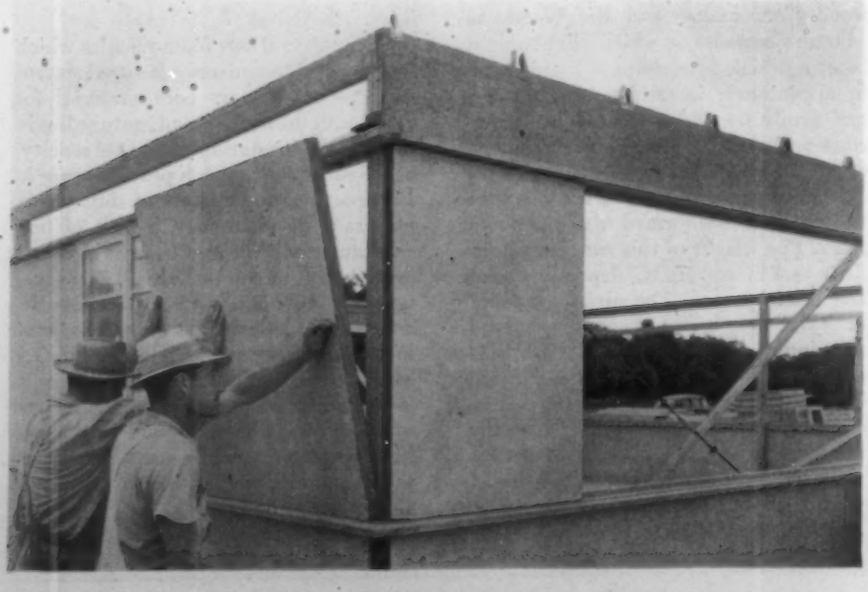
Considerable experimentation has been made on metal wall sections, particularly in the small-house field. Lincoln Houses Corporation has developed a house with lightweight walls of Bakelite resin-impregnated paper cellular core, of the honeycomb type previously mentioned, faced with aluminum sheets. The house has a concrete block foundation; and concrete poured over a grill of metal reinforcing serves as the flooring. The structural panels, 8 ft. long and 4 ft. wide, then are set into place and joined to each other by metal screws. These panels are 2 in. thick for the walls and 3 in. thick for the roof.

Harman Homes, produced by William H. Harman Corporation, features a patented steel framing and sheathing interconnected to form a monocoque shell for the entire house. Insulation of the outside steel walls is provided by a non-rigid blanket type material applied to furring strips which are attached to the steel structure between inner and outer wall sections. Interior walls and ceiling consist of ⅜-in. thick plasterboard for walls, ceilings, partitions, and closets, except in the bathroom, which is of waterproof asbestos cement board.

Harman's houses may well be the first housing development to be granted a guaranteed market by the National Housing Administration, following analysis of its materials and construction method by the NHA Technical Branch.

Then there is the Higgins house which employs wall sections made with enameled steel panels. These are sheets of low-carbon steel of various sizes upon which is baked a porcelain enamel facing. Inner and outer panels are securely fastened together 2½ in. apart, and an aerated concrete poured between them.

In low-cost wartime housing, Cemesto board was used as a lightweight-panel wall section. Manufactured as a single structural board, it combines a 1½-in. core of insulating material with a weather face and interior wall surface of asbestos cement, ⅛ in. thick



OFFICIAL INTEREST IN NEW MATERIALS

Wilson W. Wyatt, Housing Expediter and Administrator of the Veterans Emergency Housing Program, has stated that, "Just as we are doing everything possible to increase the supply of existing traditional materials, such as lumber and bricks, for the conventional builder, we are at the same time going to do all we can to enable developers of new materials and construction methods to make their maximum contribution to the housing program.

"The country's housing needs are so great that all the houses that all the conventional builders can erect won't be enough. We believe that the quickest and cheapest way of supplying additional housing capacity is through industrially-made homes. We want the present prefabricating plants to build all the veterans houses they can, consistent with our low-cost program. But since most of them use lumber and plywood, their output will be restricted to the amount of both they can get. For the additional production needed, and especially to achieve low-cost housing, we are encouraging the mass production of factory-built houses to be made largely out of aluminum, steel, plastics, and concrete.

"Metal houses are very promising from several angles. They lend themselves to assembly-line production, the same as automobiles and airplanes. Mass production makes for low cost, an equally important factor in our veterans housing program.

"Concrete houses are also encouraging. Materials are in ample supply and relatively low in cost. Data on hand indicates good possibilities for low-cost homes."

Both groups, Mr. Wyatt points out, are experimenting with a number of new materials. In the metal group, for example, thin metal sheets are bonded to a core made of a variety of materials, such as plastic-impregnated paper, balsa wood, and plywood which have both insulating and structural value. In the case of one product, foamed concrete is poured between metal sheets. In the concrete group, the producers are finding ways to reduce the weight of their product. In some cases, lightweight aggregates, like wood fibers, slag, and volcanic rock are being used. [In some instances clay pellets and certain types of rock are subjected to heat, which causes contained water to be converted to steam, exploding the clay or rock and giving them a "popcorn" effect.] When used with cement, this type of aggregate gives improved insulation and reduces the weight per cu. ft. to ⅓ to ¼ the weight of ordinary concrete.

A similar note is sounded by John R. Steelman, new Reconversion Director, demonstrating the current strong trend

toward new materials. In his report, Mr. Steelman cited materials which "have been found useful — though on a small scale, since they cannot get into high volume production for some time."

These materials include:

"Precast concrete panels, which will make it possible to build concrete houses without scarce equipment; new aggregates for use in concrete mixing, such as slag, wood chips, waste paper, and agricultural waste; pre-stressed floors and floor panels; wallboards made of plastics and chemically-treated fibrous waste; wallboards which are fireproof and have high insulating properties; wallboards reinforced with noncritical metal sheeting, and wall panels consisting of two outside 'skins' separated by a structural frame of lumber or metal or held together by an insulating core . . . to save the lumber required for inside framing."

BUILDING CODES

In order to utilize fully the advantages of these new materials and construction methods, improvements in our building codes are needed. In recent years a great deal has been written and said concerning the substitution of performance requirements for detailed specifications as used in most building codes. While this is a desirable step, there is danger in setting up performance requirements unless they are realistically related to actual functional needs. I should like to differentiate between performance requirements and functional performance requirements by giving an example. In Report B MS-88, "Recommended Building Code Requirements for New Dwelling Construction," of the National Bureau of Standards, the following definition is given (italics are mine):

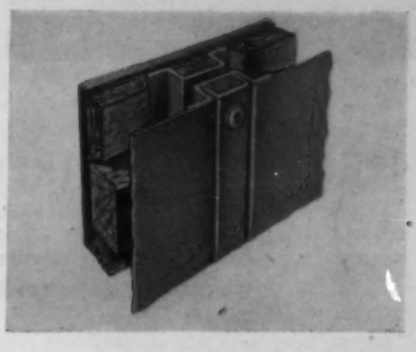
"(a) Type I. Fireproof Construction. That type of construction in which the structural elements are of incombustible materials with fire-resistance ratings sufficient to withstand the fire severity resulting from complete combustion of the contents and finish involved in the intended occupancy.

"*But not less than the rating specified in Table 1.*"

The first part of this definition is a functional performance requirement and in my opinion is the type of functional performance requirement that should, in principle, be applied to all types of housing regulation. This first half of the definition was put in at the insistence of the most progressive members of the committee drafting this report; the latter part of the definition may set minimal test conditions which are much more severe than those in the first half.

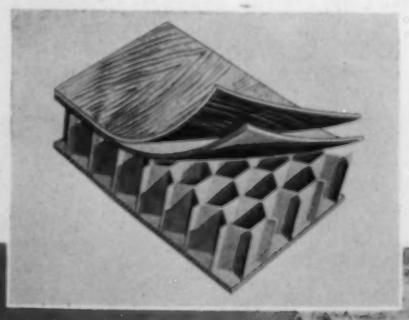
APPEARANCE

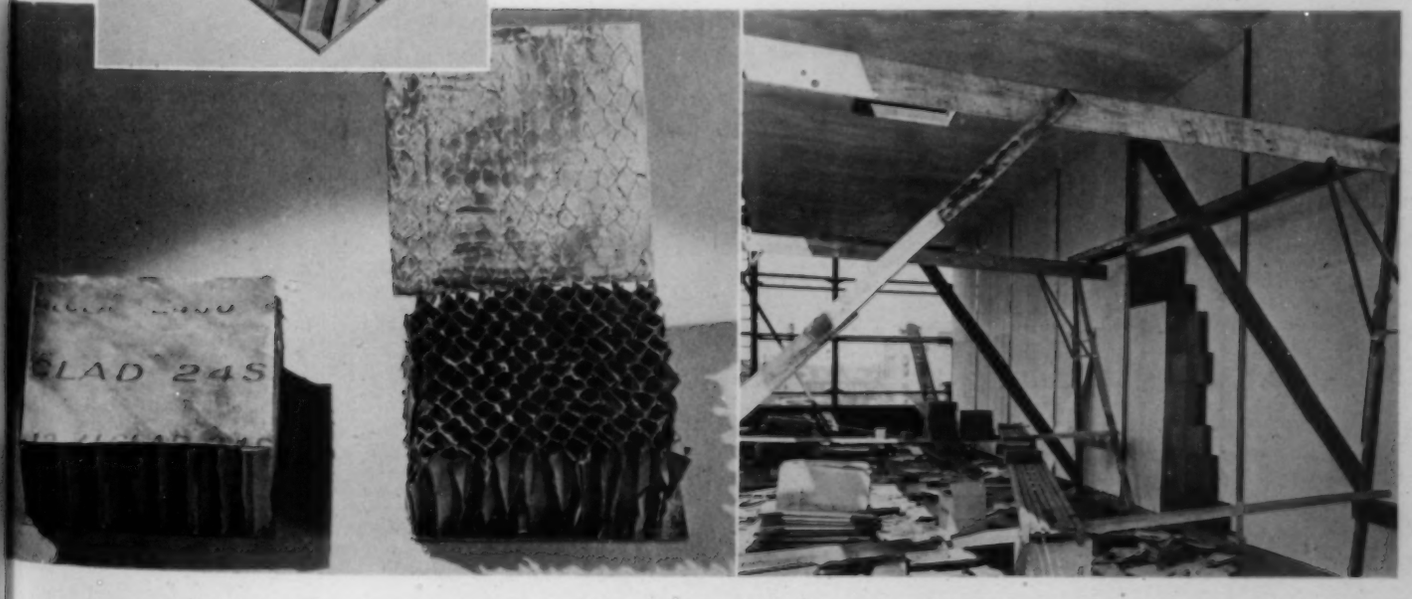
The question is often raised as to whether or not people will accept radically new materials and construction materials. They will if the materials and methods are a real advance from the standpoint of quality and economy. There is an interesting commentary on the acceptability of new materials in the case of office furniture. Originally filing cabinets were of wood in which the natural grain showed through the coat of varnish. The first metal cabinets were made to resemble wood by giving the metal surface an imitation grain finish. Later on, the public accepted the idea of finishing the metal a solid color such as dark green, which in no way imitated wood. Finally, due to the metal shortage during the war it became necessary to manufacture filing cabinets again from wood, but these were made to resemble metal in design and color. Similarly, I believe that new materials will someday come to be accepted frankly for themselves, rather than forced to imitate the older materials, as is often the case today. And their acceptance may someday be so complete, that the older materials might well be forced to imitate the new, should the occasion arise.



Steel framing and sheathing interconnect to form the shell of the Harman house

Photos courtesy of Pittsburgh Corning Corp., Celotex Corp., Bakelite Corp., William H. Harman Corp., Lincoln Houses Corp.





Left: Honeycomb-plywood laminate, first used for bulkheads in aircraft, is now being studied as material for wall sections. Below, left: Sample of Bakelite resin-impregnated paper cellular core faced with aluminum sheet metal used for walls in Lincoln house. Aluminum sheet has been sheared away from tenacious bond to show honeycomb. Below, right: Foamglas, here being used in separate block form as insulation between asbestos-cement boards, offers interesting possibilities as core in integrated wall sections

LIGHTWEIGHT FIRE-PROTECTION FOR STEEL

Fireproofing tests indicate that vermiculite-gypsum plaster may offer a lightweight and space-saving means of protecting structural steel surfaces.

THE vermiculite and gypsum industries are now offering vermiculite-gypsum plaster, already known for its sound-deadening and insulating qualities, as a space-saving and weight-saving means of fireproofing structural steel members. It should prove particularly effective for protecting steel joist floors, where 1 in. of vermiculite on metal lath will provide 4 hr. of fire-resistance, perhaps meaning the difference between a Class II and Class I building, with reduced weight, increased space, and reduction in insurance rates.

In order to demonstrate this usefulness of vermiculite-gypsum plaster on metal lath as a fire-retardant for structural steel not otherwise fireproofed, a series of fire, hose stream, and deflection tests were recently conducted by Munn and Steele, Inc., with the cooperation of the Pittsburgh Steel Company, Steel-Joist Institute, Newark Plaster Company, and the Gypsum Association. Test engineers were provided by Protexol Laboratories, Inc.

Vermiculite is made of inorganic minerals that are hydrous silicates derived generally from alteration of some kinds of mica. The specific purpose of the tests was to determine its value in plaster form to protect structural members in Class A construction, which requires that the protected steel temperatures shall not exceed 925° F. in 4 hr. with the furnace attaining a temperature of 2000° F. under the conventional time-temperature curve. Members tested included floor, girder, and column assemblies, and 1 in. of vermiculite plaster on wire lath was found to give the required protection in every case except that of columns, where the limit was reached at the end of 3 hr. and 35 min. A column which received the additional protection of a fill of loose vermiculite successfully passed the 4-hr. test.

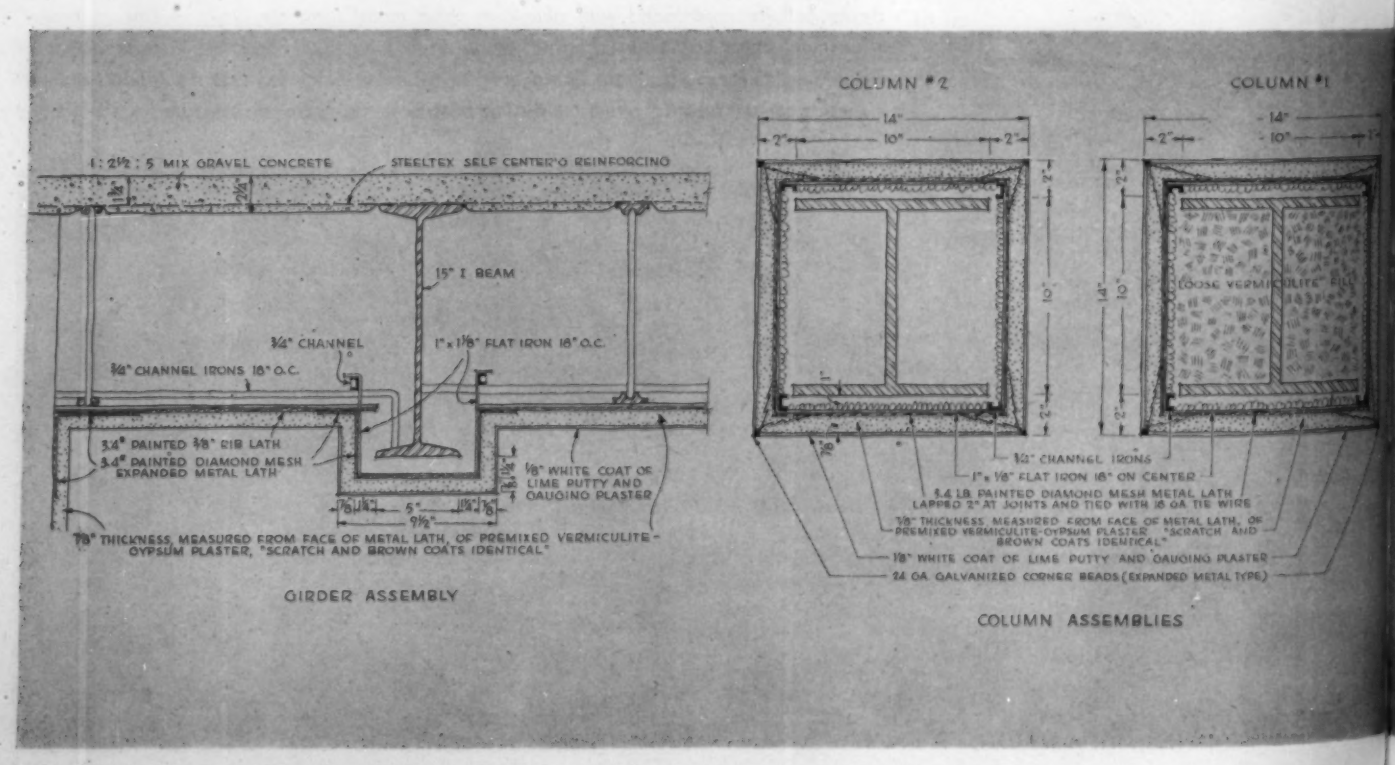
TEST STRUCTURE

For test purposes an outdoor concrete structure, 13 ft. by 20 ft. in interior dimension, was constructed. The assemblies of floor, girders, and columns were designed and erected to comply with the Administrative Building Code of the City of New York, and structural minimums were selected so that all heavier construction would be covered if the tests were successful. The test structure was erected by a recognized general contractor and his subcontractors, and received the conventional inspections that would be given by an architect's field representative.

Seven (Type 123) bar joists of six manufacturers, representing expanded, fusion, and resistance-welded types were placed on 24-in. centers with a 4-in. bearing on the furnace walls. Standard anchors and bracing were used.

A typical 15-in. I-beam, 20 ft. long, was also placed on the furnace wall, its upper flange in line with the upper chords of the bar joists. Two 10-in. H-columns, 9 ft. long, were suspended from the I-beam.

The shell above the beams was composed of steeltex self-centering floor reinforcing clipped to the beam and joists and a concrete slab composed of 1 part portland cement, 2½ parts sand, and 5


1:2½:5 MIX GRAVEL CONCRETE
STEELTEX SELF CENTER'G REINFORCING
15" I BEAM
¾" CHANNEL
¾" CHANNEL IRONS 16" O.C.
1" x 1⅛" FLAT IRON 16" O.C.
¾" PAINTED ⅜" RIB LATH
¾" PAINTED DIAMOND MESH EXPANDED METAL LATH
⅛" WHITE COAT OF LIME PUTTY AND GAUGING PLASTER
⅞" THICKNESS MEASURED FROM FACE OF METAL LATH, OF PREMIXED VERMICULITE-GYPSUM PLASTER, "SCRATCH AND BROWN COATS IDENTICAL"
GIRDER ASSEMBLY
COLUMN #2
COLUMN #1
14"
2"
10"
2"
½" CHANNEL IRONS
1" x ⅛" FLAT IRON 16" ON CENTER
3.4 LB PAINTED DIAMOND MESH METAL LATH LAPPED 2" AT JOINTS AND TIED WITH 16 GA TIE WIRE
⅞" THICKNESS MEASURED FROM FACE OF METAL LATH, OF PREMIXED VERMICULITE-GYPSUM PLASTER, "SCRATCH AND BROWN COATS IDENTICAL"
⅛" WHITE COAT OF LIME PUTTY AND GAUGING PLASTER
24 GA GALVANIZED CORNER BEADS (EXPANDED METAL TYPE)
COLUMN ASSEMBLIES

parts gravel, ready-mixed, poured in place to a thickness of 1¾ in. over joists and beam, with a mean thickness of approximately 2 in. To form the ceiling within the furnace, ⅜-in. hy-rib 3.4-lb. metal lath was wired direct to the lower chords of the bar joists. No cross channels or furring was used. The I-beam and columns were boxed with 3.4-lb. diamond-mesh lath over ¾-in. channel corners, spaced 1 in. apart from beam and column flanges.

For the purpose of recording temperatures during the test, batteries of thermo-couples were installed in the furnace, on the lower chords of joists, on the girder, on each column, and on the slab surface.

FIREPROOFING PLASTER

Vermiculite-gypsum plaster of a standard premixed formula produced under factory control, and tinted for identification, was applied in two coats (scratch and brown) to ⅞-in. grounds on furnace walls, columns, and ceiling. A lime putty white coat, ⅛ in. thick, was applied as a finish coat. The floor, column pits, and interior furnace pylons were constructed of concrete made with 1 part portland cement and 6 parts of expanded vermiculite, job-mixed. No admixtures were used.

Column No. 2 was protected solely by the ⅞-in. thickness of vermiculite-gypsum plaster over the face of the lath. Column No. 1 was identically protected, except that a loose fill of expanded vermiculite was poured between the column and lath keys to within 6 in. of the column-beam junction.

TEST RESULTS

The furnace was fired to follow the time-temperature curve prescribed in the Code, rising at the end of 4 hr. and 5 min. to 2007° F. The floor was loaded with 40 lb. per sq. ft. during the test.

At the end of 4 hr. 5 min. the furnace fire provided by two oil burners was extinguished. The average temperature on the joists was 763° F.; on the girder, 736° F.; on column No. 2 (the unfilled column), 1101° F.; on column No. 1 (filled with loose vermiculite), 864° F.; and the surface slab, 263° F. Allowable slab temperature was 329° F. Average temperature of the entire steel assembly was 865° F.

Column No. 2 (the unfilled column) passed the allowable limit of 925° F. in 3 hr. 35 min., winning a 3 hr. rating by a wide margin. All other elements adequately passed the 4 hr. period.

HOSE STREAM TEST

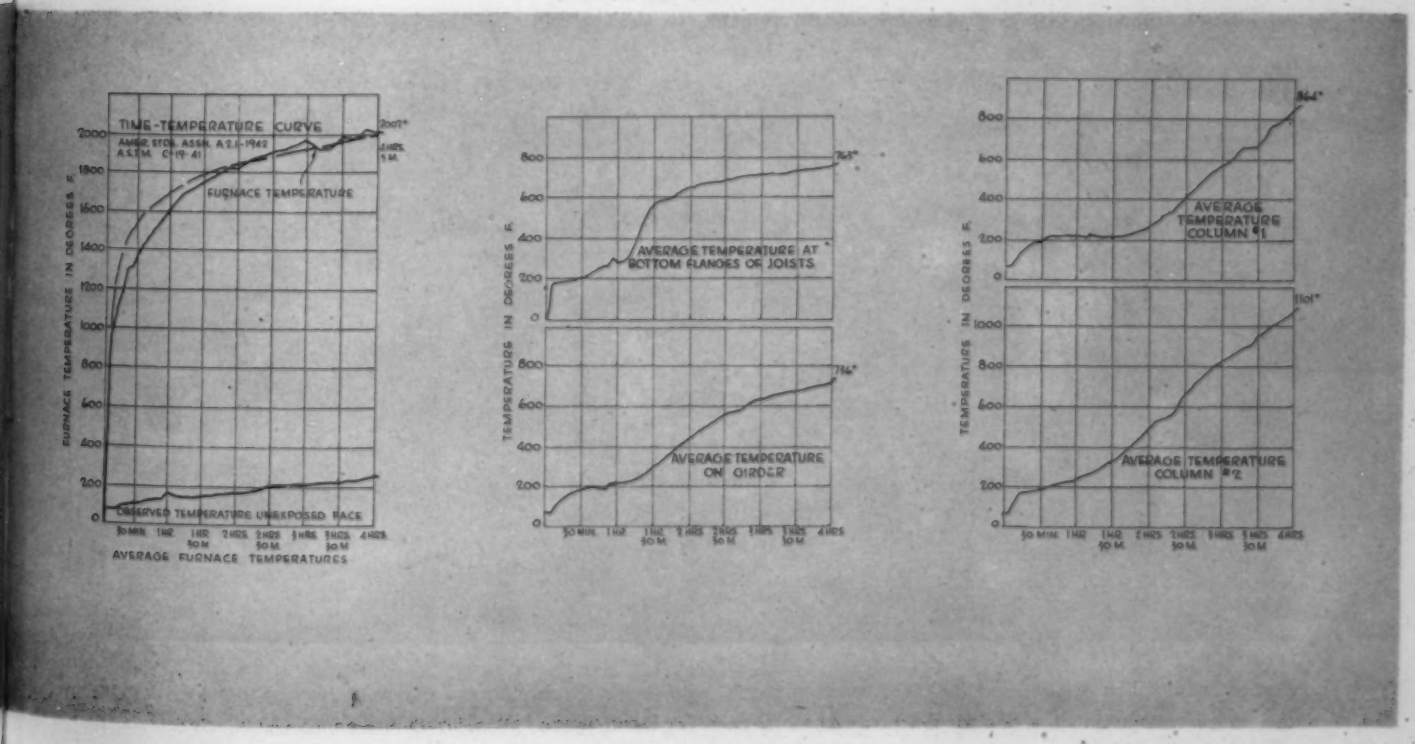
At the conclusion of the fire endurance test, the ceiling was subjected to a hose stream test by the New York City Fire Department. Adherence to 20 ft. standard distance was impracticable because the ceiling of the test structure was only 6 ft. high and the access door, 4 ft. high. The nozzle therefore had to be held much closer to the target, at a distance of only 3 ft. The hose stream was applied for 13½ min. with a nozzle pressure of 30 lb. per sq. in., and at an angle of approximately 40° from the vertical.

The stream dislodged the plaster extensively on the ceiling, and also dislodged the protection from the tops of the columns, exposing the metal lath wrapping on the sides facing the door opening. Although the N. Y. Bureau of Standards and Appeals, at this writing, has not published its findings, it is believed that these conditions were brought about by the unusually close range of the hose stream. There was no failure of structural members.

DEFLECTION TEST

Deflection tests during the fire and after the hose stream test were passed successfully. A static load of dry sand was imposed on the floor slab before the fire test, amounting to slightly more than 40 lb. per sq. ft. The day following the test, this live load was doubled and a further weight of 35 lb. per sq. ft. imposed, representing finish floor, dead weight, making a total load of 115 lb. per sq. ft. When the steel work was exposed to recover the inside thermocouples, following the test, no warping or distortion of members was observed, nor anything to indicate any difference between performance of resistance- or arc-welded joists.

Test sponsors believe as a result of this demonstration, one of the most severe tests ever attempted, that scientifically controlled and factory premixed vermiculite-gypsum plaster, having a dry weight of not over 3¼ lb. per sq. ft., 1 in. thick, is entitled to a high rating for the fire protection of steel structures requiring 4-hr. fire protection. In the case of the columns, a vermiculite fill was required to qualify beyond 3 hr. 35 min. Savings in dead load, over fireproofing practices, are obvious.


TIME-TEMPERATURE CURVE
AMER. STDS. ASSN. A2.1-1942
A.S.T.M. C19-41
FURNACE TEMPERATURE
OBSERVED TEMPERATURE UNEXPOSED FACE
FURNACE TEMPERATURE IN DEGREES F.
AVERAGE FURNACE TEMPERATURES
2007°
4 HRS. 5 M.
AVERAGE TEMPERATURE AT BOTTOM FLANGES OF JOISTS
763°
AVERAGE TEMPERATURE ON GIRDER
736°
TEMPERATURE IN DEGREES F.
AVERAGE TEMPERATURE COLUMN #1
864°
AVERAGE TEMPERATURE COLUMN #2
1101°
30 MIN. 1 HR. 1 HR. 30 M. 2 HRS. 2 HRS. 30 M. 3 HRS. 3 HRS. 30 M. 4 HRS.

AIR-ENTRAINING PORTLAND CEMENT

By C. L. Davis*

AIR-ENTRAINING cement is an improved portland cement. While it is the latest type, it is not new, having been used in many types of construction for seven years. Research on it goes back 11 years.

Before describing some of its outstanding characteristics and properties, a brief statement of the development of air-entraining principles may be of interest.

It was research on paving concrete which led to the discovery of air-entraining portland cement. Extensive research showed that the scaling of concrete pavements caused by the use of de-icing salts could be greatly reduced, and in some cases eliminated, by the use of portland cement in which a small and precise amount of air-entraining agent was interground. As a result of further experience and in recognition of its beneficial qualities, use of air-entraining cement has been extended to all types of concrete construction.

WORKABILITY CHARACTERISTICS

Air-entrained concrete is more plastic, more cohesive, and has considerably less tendency toward segregation and bleeding than does concrete made with normal cement. By segregation is meant the separation of larger aggregate particles from the mortar body during the operation of transporting and placing in the forms. These features are of particular importance in the construction of concrete walls and columns. Decreased segregation results in more uniform and homogeneous concrete particularly in a heavily reinforced wall, and the minimizing of bleeding lessens the amount of laitance (whitish scum) in the top layer of a pour, giving a formed surface virtually free of sand streaks.

DURABILITY

Resistance to alternate freezing and thawing is considered one of the principal criteria of the durability of concrete. Extensive laboratory tests and field performance have shown that air-entraining concrete possesses much greater resistance to freezing and thawing than normal-cement concrete.

When bleeding or water-gain occurs in plastic concrete, minute channels are left in the interior of the hardened concrete. These channels or capillaries appear as "sand streaks" when they occur in the contact surface between forms and concrete. The air is not in large bubbles but in millions of tiny cells uniformly distributed throughout the entire mass.

It is important to understand this distinction between the nature of the small amount of air present in normal-cement concrete and the air resulting from purposeful air-entrainment. In the latter, the millions of tiny air bubbles, because of their great surface area, immobilize the free water in the plastic concrete, thereby greatly decreasing bleeding and resulting channels. The combination of fewer channels and the disconnected air cells in the hardened concrete minimizes the opportunity for water to move into and out of the concrete. Furthermore, if some water does get into the air cells, there is space for expansion of ice crystals which lessens the danger of freezing or damaging the concrete.

DESIGN OF CONCRETE MIXTURES

Bulking effect of the entrained air causes an increased volume of concrete so that the quantities of materials that produce one cubic yard of concrete when normal cement is used will yield more than that with air-entraining cement. It is necessary, therefore, to compensate for this increase in yield by adjusting the mix slightly so as to maintain the desired cement content. Because the entrained air greatly improves the workability characteristics and increases the slump, the adjustment of the mix should be accomplished primarily by reducing the sand and water contents.

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*Engineer of Tests, Universal Atlas Cement Co. A paper by the author given before the New York Chapter, American Institute of Architects.

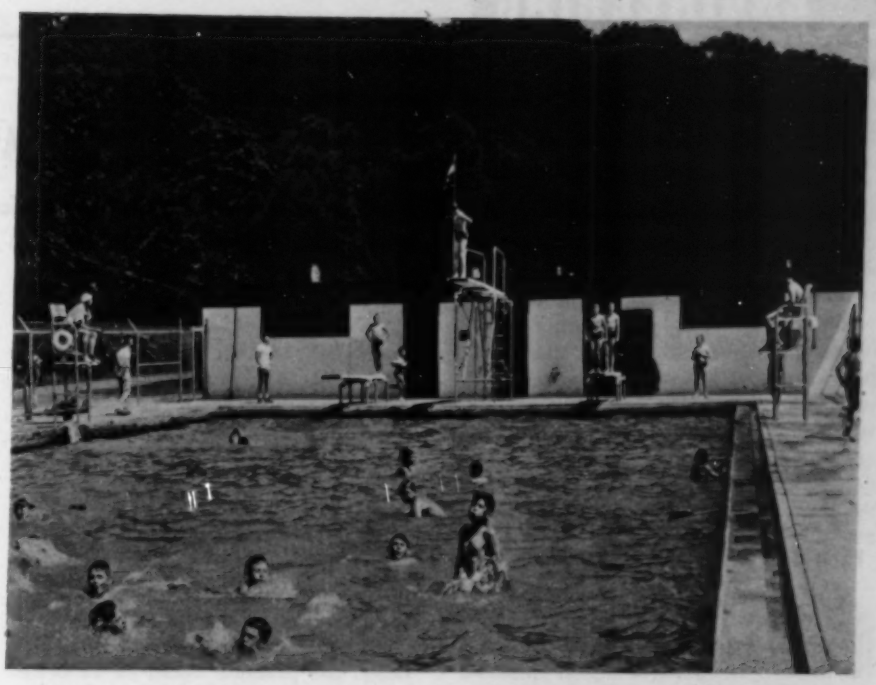
RICHARD A. SMITH Photo

New York Port of Embarkation A.P.O. used 390,000 concrete blocks, with improved appearance and increased compressive strength due to air-entrainment. Col. Edgar Garbisch, U. S. District Engineers; Alfred Hopkins & Associates, Architects

EFFECTS ON COMPRESSIVE STRENGTH

When the mix is adjusted in this manner, the concrete made with air-entraining cement generally has higher strength in lean concrete (4 sacks per cu. yd.) and slightly lower strength in rich concrete (7 sacks per cu. yd.) than does normal-cement concrete of the same cement content. This results from the fact that use of air-entraining cement permits greater reduction in sand and water with lean than with rich mixes.

For years it has been believed by many that the durability of concrete varies with its strength. However, this is not necessarily true, especially in concrete subject to severe exposure. In any event, durability should not be sacrificed for strength. It should also be emphasized that with present-day cement it is possible to make concrete twice as strong as with the cement of 25 years ago; that allowable working stresses have not increased in the same degree; that many building codes still call for 2,000 lb. concrete at 28 days, whereas with present-day cement, either normal or air-entraining, it is possible to secure this strength at 7 days. In the final result, the loss of strength, if any, is less important than the gain in durability and other desirable characteristics.



Open-air swimming pools demonstrate the durability of air-entrained concrete, since they are particularly subject to freezing and thawing effects of winter weather. Y. M. C. A. Swimming Pool, Cuyahoga County, Ohio, built of air-entrained concrete by Alger Rau, Inc.

SPECIFICATIONS

Current specifications for air-entraining cement are those of the American Society for Testing Materials ("Tentative Specifications for Air-Entraining Portland Cement," A.S.T.M. Designation: C 175–46T). These specifications include two types of air-entraining cement — Type IA for general concrete construction, and Type IIA, moderate-heat-of-hardening cement. They contain requirements for air content of standard mortar, the purpose of which is to control the amount of air entrainment. These requirements are so set as to result in an air content in fresh concrete of approximately 3 to 6 per cent which is considered the optimum range in order to obtain the desired characteristics and best results.

It is understood that the revised federal specifications for portland cement will be issued shortly and that provisions for air-entraining cements will be included in this revised printing.

APPLICATIONS

Air-entraining portland cement is being used for general concrete work such as foundations, walls, paving, sidewalks, slip-form work, gunite, and in concrete pipe and block. It also is suitable for concrete block and other machine-made, dry-tamped products, where its use makes possible blocks having a dense, rich surface texture and greater compressive strength.

Most portland cement manufacturers produce air-entraining cement. It is sold at the same price as regular cement.

These test slabs were subjected to 60 cycles of freezing and thawing and repeated applications of calcium chloride to melt ice during two winters. Left: The slab made with regular cement shows heavy scaling. Right: Air-entrained concrete remains relatively unaffected

FEE COMPETITIONS AMONG CONTRACTORS?

by J. P. H. Perry, Vice-President, Turner Construction Company

THEORETICALLY an owner proceeding to build on cost-plus-a-fee wants the best contractor obtainable. But there has grown up, at least on the eastern seaboard, a practice of holding fee competitions among contractors. Leading builders are invited to quote lump sum amounts as fees for which they will act as general contractors on a given job.

PENNY-WISE ECONOMY

Most thoughtful men grant, without much argument, that a small difference in fee should not influence their judgment in determining the best qualified contractor. They will insist further that they will not allow their decision to be influenced by a few dollars — (often less than ⅛ of 1 per cent of the total cost of the project). Nevertheless, human nature being what it is, good resolutions often cease to be either good or resolute when dollars are laid on the line.

Speaking from nearly 40 years experience involving some $300,000,000 of cost-plus-fee building contracts, I am convinced that owners and architects who choose contractors as a result of competition as to amount or rate of fee do themselves and the building industry a disservice, for they assure for themselves neither the best contractor for the job nor the greatest economy in the long run.

The very men who set up these competitions would be the very last to choose their doctors, surgeons, dentists, lawyers, consulting engineers or any other professional advisers on such a basis. A building contractor operating under a cost-plus-fee contract functions essentially as a professional man. His obligations are to erect the buildings in question at the lowest cost and in the shortest time consistent with good workmanship and the interests of the owner. The contractor's compensation is fixed. In addition to the responsibilities just mentioned, he has a further one to himself, namely, to perform so well that he may have repeat orders or cause other clients to come to him because of reputation acquired. This is just the situation which any professional man faces when he sits down across the table from each new client.

BASE COMPETITION ON MERIT

Consider what would probably happen if General Motors, duPont or Standard Oil had to select a new President or Executive Vice President. Would they be likely to invite five or six leading candidates to quote the salary for which they would undertake the job, and would they then select the man who named the lowest monthly wage? Or would their Board of Directors rather canvass the field, pick out several eligibles, and finally after interviewing each and looking up his record, decide on the man who was best qualified to serve them, and then having decided on this man take for granted that they could agree on financial terms with him?

Where the position is of less importance, the practice would be to determine a salary rate in advance. The management would then interview candidates and make every effort to determine the best qualified at the price.

In neither case would the employer *bargain* first about dollars, and second about qualifications.

FIX A FAIR FEE

The best interest of an owner would in my judgment be served if the owner did one of two things:

(a) *Fix the fee* himself and let each contractor under consideration know what the fee was to be, and then discuss the contractor's qualifications. The resulting selection would then be indeed on *merit* and not on *price*.

One may ask how owners or architects are going to fix a fair fee. There is ample information available. The Defense Plant Corporation scale of fees, while probably lower than the current market warrants, is a guide. The Mason Builders Association of New York has recently adopted a scale of contractors' fees. Or the owner or architects can talk to any leading builder and see what the general market is. It wouldn't be hard to arrive at the prevailing rate of fees.

(b) Select the contractor after a searching investigation of his qualifications and *then* negotiate with him as to the fee. Again, the selection would be on reputation, capability, availability and experience, not on dollars.

NO REAL PARITY EXISTS

I have discussed this matter with many men and usually get but one defense of fee competitions: i.e., that only contractors of equal qualifications and ability be invited to submit proposals. But *there is no parity* within any group of contracting organizations.

Let us analyze this theory, that only equally qualified contractors are in competition. What constitutes "equal qualifications" among builders? Among the yardsticks most generally used are the following:

1. *Financial Resources and Credit.*
2. *Reputation* in general and integrity, cooperation and fair dealing in particular.
3. *Experience*
   a. General — years in business or volume of work done.
   b. Specific — namely, having built similar buildings.
   c. Local — knowledge of existing conditions is often of much significance in evaluating a contractor.
4. *Organization*
   a. Is it one of line and staff or is it departmentalized?
   b. Is it composed of old or young men?
   c. Is it staffed by men who made the company's reputation or is it "a name" manned by men of other names?
   d. Is it undermanned or has it reserves and replacements?
5. *Job staff available* and the names, experience records, salary rates of the men to be assigned full time to the specific job.
6. *Project Manager* or No. 1 man on a big job. Are any two men equal?
7. *Plant and Equipment* available and at what rentals. Is the contractor likely to overplant the job?
8. *Labor Relations* — of vital importance these days.
9. *Relations with subcontractors and material men* — Do the subs like to work with this general contractor?
10. *Purchasing Power.*
11. *Time of Completion.*

I have never seen any group of contractors — who certainly know one another better than any owner or architect possibly could — who would be willing to agree on any parity among themselves. Studies of the results obtained by applying the foregoing yardsticks to any group of builders will inevitably show wide variation on nearly all the factors. There is just no such thing as equality among bidders, especially as applied to a specific building operation. Practice certainly disagrees with theory here.

For owners and architects on private work to put the cart before the horse, or actually to put "cartwheels" ($) ahead of capabilities, is in my judgment far from the correct way to select contractors to work on a fee basis.

Steel bars for reinforcing concrete feature reverse helical ribs for an improved bond

REINFORCING BAR

Introduced in 1943, the *Hi-Bond* steel reinforcing bar for concrete construction, developed by Inland Steel Company, will soon be available in greater quantities, following the licensing of Carnegie-Illinois Steel Corporation and other subsidiaries of U. S. Steel Corporation to manufacture and sell it. Designed to offer a bearing surface more than double that of usual commercial types, this reinforcing bar features an arrangement of reverse helical ribs that results in a maximum bond between steel and concrete in order to realize the full potential strength of the reinforcing steel. The bar has subsequently been subjected to independent tests conducted by the U. S. Bureau of Standards and laboratories at the Universities of Illinois and Wisconsin, which reportedly show that it contributes to sounder and more economical reinforced concrete construction through an improved bond that makes possible more efficient transfer of stress at splices, better crack control, superior resistance to slip, and an opportunity to design for higher stresses. Inland Steel Co., 38 S. Dearborn, Chicago 3, Ill.

WALL COATING

A new paint, *Tite-Wall*, especially designed for use on concrete and cinder block, but usable on practically any rough, porous surface, is mixed with water, and paints out like an oil. Two coats are said to waterproof exterior block walls and to considerably reduce dampness and seepage even in damp basements. Truscon Laboratories, Inc., Caniff and Grand Trunk R.R., Detroit 12, Mich.

CONSTRUCTION CORE

A new construction material called *Honeycomb* has a cellular core made from paper, cotton or fiberglas, fabricated into blocks resembling huge honeycombs, and then sliced to the desired thickness before assembly. Faces of metal, wood veneer or plywood are bonded to the core with a plastic thermosetting adhesive which develops a permanent bond actually stronger than the materials it bonds together. At the present time the material is custom built to specifications in thicknesses varying from ¼ in. to 1 in. It was developed jointly by U. S. Plywood Corp. and the Glenn L. Martin Co.

FAST-SETTING GLUE

A new cold-run fast-setting resin wood glue, *Wood-Lok*, has been developed for joint assembly operations in every type of wood. This resin glue is said to be the only type that can be handled and machined after 20 to 30 minutes' clamping time, instead of the usual six to eight hours, providing a strong, resilient bond unaffected by humidity changes. It is cold-run and therefore its bonding quality is not weakened by constant heating. Wood-lok is a liquid, ready for use, and does not harden in the pot. Other announced advantages are that its use eliminates "chilled" joints, and there is no need to heat the glue or the wood; also, that it neither embrittles nor forms a rock-hard abrasive film to dull saws and knives. Colors range from pure white for colorless drying without glue line, to darker shades for special uses. National Adhesives, 270 Madison Ave., New York 16, N. Y.

ASBESTOS PLASTER

Ready-mixed and applied in much the same manner as ordinary plaster, *Clapseal* is a new self-bonding asbestos plastering material, said to provide an exceptional combination of lightweight fire-protection, thermal insulation, and noise reduction. It reportedly will adhere without mechanical binding to any non-oily surface; and finish plasters, porous papers, or water-, oil-, asphalt-, and rubber-based paints may be applied directly to it to improve appearance or furnish added protection. The manufacturer points out that it should not be used where it may be exposed to weather, since its reaction to moisture is similar to that of ordinary plaster, nor where it will be subjected to excessive abuse, since it is somewhat softer than ordinary plaster, and, while as readily patched, will dent under pressure more readily. Brooks Green Co., 673 Boylston St., Boston 16, Mass.

STEEL STAIR UNITS

Recently announced is a pressed steel sectional stair unit which combines tread and riser in one piece of formed metal, punched and slotted so that, according to the manufacturer, a full stairway can be put up in only 90 minutes. This stair unit is a modification of a steel stair originally developed for manufactured houses. The standard unit is made of 12-gauge steel with an over-all width of 36 in. Two of the units may be placed end to end to form a 72-in. wide stairway. The tread is 9 in. deep and riser, 7½ in. high. A lip extending above the tread has a 1⅜-in. slotted hole through which bolts secure the lower unit to the one above. This slot permits adjustment for the height of the rise to the extent of 1 in., from 7 to 8 in. Units are finished in standard gray and may be covered with rubber treads, with carpeting (cemented or secured by carpet rods), or may be painted. Hardware for assembly and instructions are included in each set of 13 units for the stairs and one for the top. Home Ola Corp., 9 S. Clinton St., Chicago 6, Ill.

Model of x-ray laboratory units assists architects in hospital planning and design

X-RAY LAB MODELS

Three-dimensional models, a tool commonly employed by industrial architects and planning engineers for arriving at most efficient utilization of production space, have been adopted by the Westinghouse X-Ray Division to assist in rehabilitating and expanding the nation's war-worn x-ray facilities. Value of replacement and expansion is expected within several years to reach $35 million a year. In planning a modern x-ray laboratory, the hospital architect coordinates the desires of many individuals. This model permits duplication of existing or proposed facilities in miniatures making possible visual arrangements that are located to the satisfaction of hospital superintendent, radiologist or roentgenologist, operating technicians, and members of the hospital directing board. The model kit contains 1000 individual pieces, scaled one inch to the foot. Models of X-ray equipment, walls, floors, windows, and doors are developed in wood, metal, and plastic. Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh 30, Penn.

(*Continued on page 138*)

MANUFACTURER'S LITERATURE

CHURCH ORGANS

A Practical Approach to the Church Organ Problem. A booklet pointing out the advantages claimed for the Wurlitzer organ in churches of all sizes, with particular stress on the space saving and economical features. Includes technical data about organ placement and selection, and typical floorplans. Also included is a series of scale plans of Wurlitzer organs. 28 pp., illus. The Rudolph Wurlitzer Co., Organ Division, North Tonawanda, N. Y.

DEAERATORS

Cochrane Atomizing Deaerators (Publication 4160). Technical details and application data for the atomizing type of deaerator developed by Cochrane to meet the demand of marine engineers. Includes diagrams and a catalog of accessories. 20 pp., illus. Cochrane Corp., 17th St. below Allegheny Ave., Philadelphia 32, Penn.

ELECTRICITY

Planning Your Home for Better Living Electrically. Home building and remodeling tips for kitchens, laundries, lighting and air conditioning. Selection and location of equipment, decoration, placing of outlets, electrical appliances and conveniences, wiring information, costs. 64 pp., illus. General Electric Co., 1285 Boston Ave., Bridgeport 2, Conn.* 25 cents.

HEATING

Automatic Coal Stoker, Residential Models RB 20, RB 35, and **Floor Furnaces, Series 1500.** Descriptions, specifications, features and dimension sketches of two models of the stoker, and similar information on one floor and two wall furnaces. 4 pp. ea., illus. Rheem Mfg. Co., Dept. AR, 714 W. Olympic Blvd., Los Angeles, Calif.

The Answer Book on Home Heating. Information for the home owner and prospective home owner on heating and air conditioning: types of system available; thermostats; insulation; solar heating; heating and air conditioning equipment. 28 pp., illus. General Electric Co., Air Conditioning Dept., 5 Lawrence St., Bloomfield, N. J.*

Fitzgibbons "D" Type Steel Heating Boilers. Catalog of boilers designed and constructed according to Steel Boiler Institute Rating Code. How to select a boiler for specific requirements. Complete details on each model in the line. Engineering tables, diagrams. 12 pp., illus. Fitzgibbons Boiler Co., Inc., 101 Park Ave., New York 17, N. Y.*

Looking Ahead with Oil Heat. By W. A. Matheson. Booklet describing the advantages claimed for oil heating systems and the types of mechanized oil burners now on the market. Four "laws" for correct oil combustion. 20 pp. Williams Oil-O-Matic Division, Eureka Vacuum Cleaner Co., Bloomington, Ill.

Panelaire: The Warm Air Panel Heating System. Design and installation manual for a system of radiant heating using ceiling panels. Calculation and design diagrams and examples, examples of procedure, Btu requirements tables, tables of duct and pipe sizes and c.f.m. capacities. Specifications and complete construction details. 36 pp., illus.

Whiting Stokers (Specification Sheet 608). Mechanical details, specifications and advantages of Whiting H-C stokers featuring horizontal-compression principle. Diagrams of front and rear ash arrangement models. 6 pp., illus. Whiting Stoker Sales Co., 11 S. La Salle St., Chicago 3, Ill.

Wing Products. Condensed catalog of unit heaters, ventilating fans, motor and turbine driven blowers and turbines. Brief description and photo of each piece of equipment, and reference to bulletin giving complete specifications. L. J. Wing Mfg. Co., 154 W. 14th St., New York 11, N. Y.*

INSECTICIDES

Confused About Insecticides? and **Pennsalt DDT Emulsion.** Two leaflets describing DDT compounds for civilian use — household insect sprays, insecticide powder, livestock spray, and "garden dust." Instruction for use included. Pennsylvania Salt Mfg. Co., 1000 Widener Bldg., Philadelphia 7.

LALLY COLUMNS

Lally Column Concentric Safe Load Table and **Formula for Computing the Safe Carrying Capacity of Light and Heavy Weight Lally Columns.** Handy tables, with explanatory notes and diagrams. Lally Column Co. of N. Y., Inc., 211 Lombardy St., Brooklyn, N. Y.

OFFICE RECORDS

Diebold Tested Methods and Equipment for Better Record Management and Protection. Catalog of record files, cross files, safes, cash drawers, metal doors, and microfilming equipment. 16 pp., illus. Diebold, Inc., Canton 2, Ohio.*

PRINTERS

More for the Money: Bruning Model 40 BW Printer and **Simple Versatile Modern Bruning Model 158 Developer.** Specifications and description of two machines featuring simplicity and compactness. 4 pp. ea., illus. Charles Bruning Co., Inc., 4654 Montrose Ave., Chicago 41, Ill.

SHEET COPPER

Research Solves Problem of Stress Failures in Sheet Copper Construction. A detailed report on the reasons for failures of copper sheet used for gutters, flashings and roofs. Proposed solution, with charts showing effect of shape, temper and gauge on strength, determination of gauge and expansion joint locations for various sizes and shapes of copper gutter linings, and formula for safe critical load. Details of sheet copper installations, with 30 detail sheets giving installation methods for seams, flashings, high and low parapet walls, roofing, gutters, expansion joints, etc. Table of thickness and weight of sheet and strip copper. 92 pp., illus. Revere Copper and Brass, Inc., 230 Park Ave., New York 17, N. Y.*

SILICONES

How to Use DC 996. Description of a high temperature Silicone insulating varnish which cures at ordinary baking temperatures and protects electrical equipment operating continuously at temperatures up to 350° F. Contains instructions on how to apply and cure DC 996; includes tables of properties and specifications. 4 pp., illus. Dow Corning Corp., Midland, Mich.

TEMPERATURE CONTROL

Wheelco Multronic Capacitrol (Bulletin D4-2). Description of a flexible electronic pyrometer controller using two electronic control circuits and featuring instantaneous control action. Lists applications and features, describes the operation, shows typical installation diagrams. 4 pp., illus. Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.

TREATED WOOD

Wolmanized Lumber. Description of a vacuum-pressure treated lumber, impregnated with an odorless, paintable, non-corrosive and non-leachable preservative for protection against wood-destroying fungi and termites. Suggestions for use. Diagrams of use in residential construction. 6 pp., illus. American Lumber & Treating Co., 332 S. Michigan Ave., Chicago, Ill.*

(*Continued on page 156*)

* Other product information in Sweet's File, 1946.

Value of Sound Conditioning

BEING architects, you already *know*. That's why the majority of your specifications for new building call for sound conditioning.

The problem—architecturally speaking—is to specify the right *material* and the right *applicator*. Acousti-Celotex* offers you *both*.

It's the right material because it's the original and genuine drilled fibre tile, most widely used of *all* acoustical materials. Acousti-Celotex can be easily, quickly installed—and is simple to maintain through the years. Repeated painting does not affect its sound conditioning efficiency.

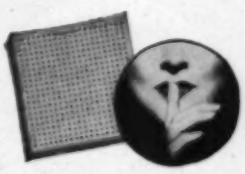
Your local Acousti-Celotex distributor is the right applicator because he is a trained technician, member of the world's only sound conditioning organization with the combined experience of over 100,000 acoustical installations.

Consult him with confidence. His advice is yours absolutely without obligation, and he *guarantees* results.

A note to us will bring the Acousti-Celotex sound conditioning expert to your desk—ready and able to assist you in any and all of your plans.

* * *

FREE! *"25 Answers to Questions on Sound Conditioning."* Interesting, fact-packed booklet. Write: *The Celotex Corporation, Dept. AR-1046, Chicago 3, Illinois.*



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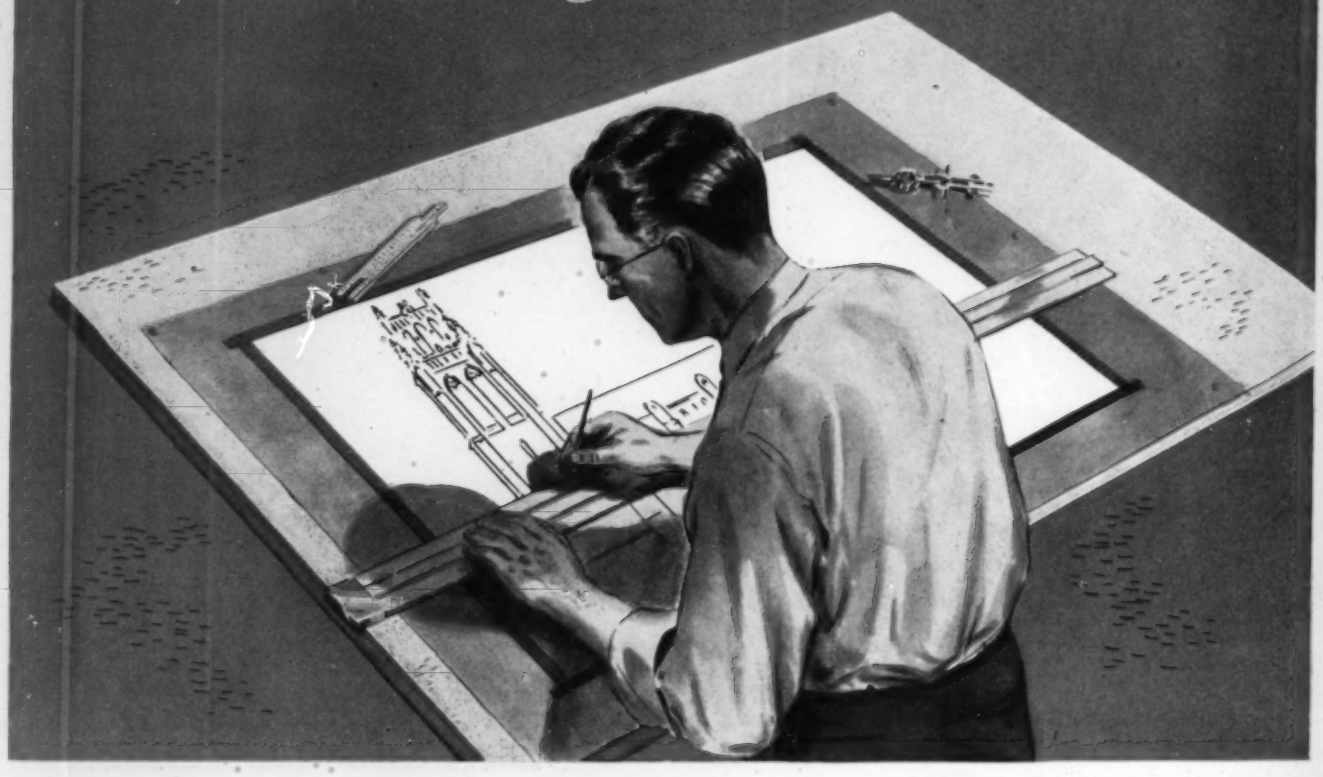
A PRODUCT OF THE CELOTEX CORPORATION, CHICAGO 3, ILLINOIS

to architects with churches on their drawing boards...



A *Suggestion Based on 68 Years' Service to Churches*

Never before in our 68-year history has there been such a keen interest in carillons, or such a widespread acceptance of genuine tower bells as an integral and essential part of the modern house of worship.

Most pastors and influential laymen now recognize what forward-looking churchmen have long known —that the music of true bells is the one most effective method of projecting the message of the church to all the community, the one most logical means of giving voice to the beauty of the edifice and the principles it symbolizes. Even when not included in the original plans, a way is usually found to install a carillon later, either through group subscription or the memorial gift of an individual donor.

Too often in such cases we find that the architect has not made proper provision for tower bells. Although a Deagan Carillon is a marvel of compact design, delivering many times more volume per pound of metal than old-style bells, ideal results still call for the observance of a few simple rules as to dimensions and relative height of the tower.

With these facts in mind, we earnestly suggest that you anticipate the installation of genuine bells and make your plans accordingly. To do otherwise may necessitate later alterations or, even worse, encourage the adoption of synthetic loud-speaker music which is entirely out of keeping with the true principles of ecclesiastical architecture that you have observed in your design.

★ ★ ★

Our Architectural Service Department stands ready to assist you in making provision for tower bells by sending you detailed information on the dimensions and specifications of a proper bell tower. Please address Department 374, J. C. Deagan, Inc., 1770 Berteau Ave., Chicago 13, Ill.

GENUINE CARILLONS ★ HARMONICALLY TUNED

DEAGAN

CHECK LIST ON CHURCHES

These two pages are reprinted from the building questionnaire used by the Archdiocese of Los Angeles. The Archbishop directs that two copies of the information be made, signed by the pastor and architect, and submitted to building committee with plans and sketches. (The actual questionnaire carries a page arranged for noting the approval, criticisms and objections of the Archdiocesan Building Commission.)

PROPOSED CHURCH

Parish..... City.....
His Excellency approves loan of $.....
Estimated parish debt on completion $.....
Type of architecture..... Estimated cost..... Sq. foot cost?.....
Length and width..... Height of walls..... of roof line..... of tower.....
Construction material..... of roof..... of floor.....
If concrete — width of walls?..... Reinforced?..... What waterproofing?.....
If wood or stucco — what termite and dry rot preventatives?.....
Church faces which direction?..... Main boulevard or car line by side windows?.....
Bell?..... Chimes?..... What parking provisions?.....
Estimated number of weeks to complete construction.....

NAVE

Dimensions..... Finish material of ceiling..... of inside walls.....
Width of main aisle..... of side aisles..... Seating capacity.....
Floor — level or sloped?..... Number of rows of pews..... Length of pews.....
Inches between pews — back to back..... Distance from top of kneeler to arm rest.....
Maximum for comfort 26 inches.
Number of confessionals..... Dimensions..... Lighted?..... Ventilated?.....
Sound proofed?..... Hearing aids?..... Dimensions of kneelers and arm rests.....
Light back of confessor's name?..... Light to show when penitent in?.....
Number of windows..... Dimensions..... Distance from floor to window sills.....
Type of church lighting..... How many units..... Where located.....
Type of heating..... How many units.....
Where located..... Air Conditioning?.....
Type of stations..... Size..... Has their location been determined?.....
Floor plugs provided for cleaning?..... At space for crib?..... At shrines?..... For clock?.....
Material of altar railing..... Space between altar railing and front pew.....
If steps at front entrance, has a side entrance at street level been provided?.....
Will windows open for ventilation?..... How controlled?.....
Number of pillars..... Has acoustical engineer been consulted?.....

SANCTUARY

Dimensions..... Height of ceiling.....
Floor material..... Height above nave floor..... Number of exits.....
Type of altar..... material..... Dimensions.....
Conforms to rubrics?..... Altar canopy?..... Dimensions of predella.....
Number of steps?..... Height to altar table.....
Inches from front to tabernacle..... Tabernacle wired for burglar alarm?.....
Tabernacle securely bolted to altar?.....
Side altars..... How many?..... For Mass?..... Dimensions.....
Niche beside altar for cruets?..... Pipes in floor for flags and banners?.....
Pulpit?..... Location..... Dimensions.....
Height above sanctuary floor..... Loud Speaker System?..... Spotlighted?.....
Number of windows..... Size..... Type of lighting..... How many units.....
Small wall safe for holy oils?..... Sacring bell?.....

(*Continued on page 135*)

DAY-LINE*

The "ONE-MAN" *Fixture*

This heavy-duty Day-Brite Industrial Fluorescent system saves time and money on every installation —every service operation:

- One man *alone* can quickly hang the Day-Line with chain or patented Day-Brite "Ice-Tong" hangers.
- Rugged, die-formed steel channels designed for simplified unit or continuous mounting—plenty of knockouts.
- Lifetime porcelain enameled steel reflectors fastened with two captive wing nuts can be removed and replaced in one minute for easy installation and servicing—*without tools.*

Day-Brite Lighting, Inc., 5465 Bulwer Avenue, St. Louis 7, Mo. Nationally distributed through leading electrical supply houses.

In Canada: address inquiries to Amalgamated Electric Corporation, Ltd., Toronto 6, Ontario.

* Patent Nos. 2317494, D135375, D133458, 944

IT'S EASY TO SEE WHEN IT'S

DAY-BRITE *Lighting*

CHECK LIST ON CHURCHES (*Continued from page 133*)

SACRISTY

Dimensions..... Number of doors to Sanctuary..... Height of doors.....
Ceiling height..... Convenient entrance for priests?..... For people?.....
Number of windows?..... of lighting fixtures?..... Floor plugs?..... For clock?.....
Dimensions of vestment cases?..... of wardrobe cases?..... of free floor area?.....
Have you planned for lavabo?..... Sacrarium?..... Safe?..... Wine closet?.....
Fireproof cabinet for censer?..... Toilet?.....
Dimensions of storage space for envelopes..... Pamphlets..... Funeral candlesticks.....
Banners..... Laundry, etc.....
A small squint to be able to see into the church?..... Full length mirror?.....
Any communication system to choir?..... Vestibule?..... School?..... Rectory?.....
Will panel for electric control be located so that you can easily tell if lights are working?.....

BOYS' SACRISTY AND FLOWER ROOM

Total dimensions..... Accessible to sanctuary?..... To outside for candle and flower delivery, to incinerator, etc.....
Dimensions of cupboards for cassocks and surplices.....
Dimensions of storage space for candelabra and vases, etc.....
For candles and votive lights..... Because of danger of melting, is candle storage space against wall not touched by the sun or heating unit?..... For tall vases has a high faucet been specified for sink?.....
To avoid breakage has wood or rubber drainboard been specified?..... Any provisions for hot water?..... Where are storage facilities located for janitor's cleaning equipment and supplies?.....

VESTIBULE

Dimensions..... Dimensions and number of outer doors..... of doors to nave.....
Number of steps to street level..... Width of treads..... Height of risers.....
Location of poor box..... Provision for its security?.....
Dimensions of announcement board..... of space for papers and pamphlets?.....
Built in holy water fonts?..... What arrangement for people to get holy water?.....
Height of ceiling..... Number of windows..... Number of lighting units.....
Floor plug?..... Is there any necessity for light standards or lighting fixtures outside the church?.....
Any possibility of an auto entrance under cover?.....
City ordinance demands toilets connected with church building or adjacent thereto.

BAPTISTRY

Location..... Dimensions..... How lighted..... Floor plug.....
Wall cabinets?..... Sacrarium?..... Locked screen or gates?.....

CHOIR

Location..... Dimensions..... Seating capacity..... Height of railing.....
Ventilated?..... Lighting provisions?..... Wired for future pipe organ?.....
For echo organ?..... Blower silenced..... Floor plugs?..... Music storage?.....
Floor and stairs noise-proofed?.....

SHRINES

How many?..... Where located?..... Dimensions..... How lighted.....
Will altar be used for Mass?..... What provisions for security of donations?.....

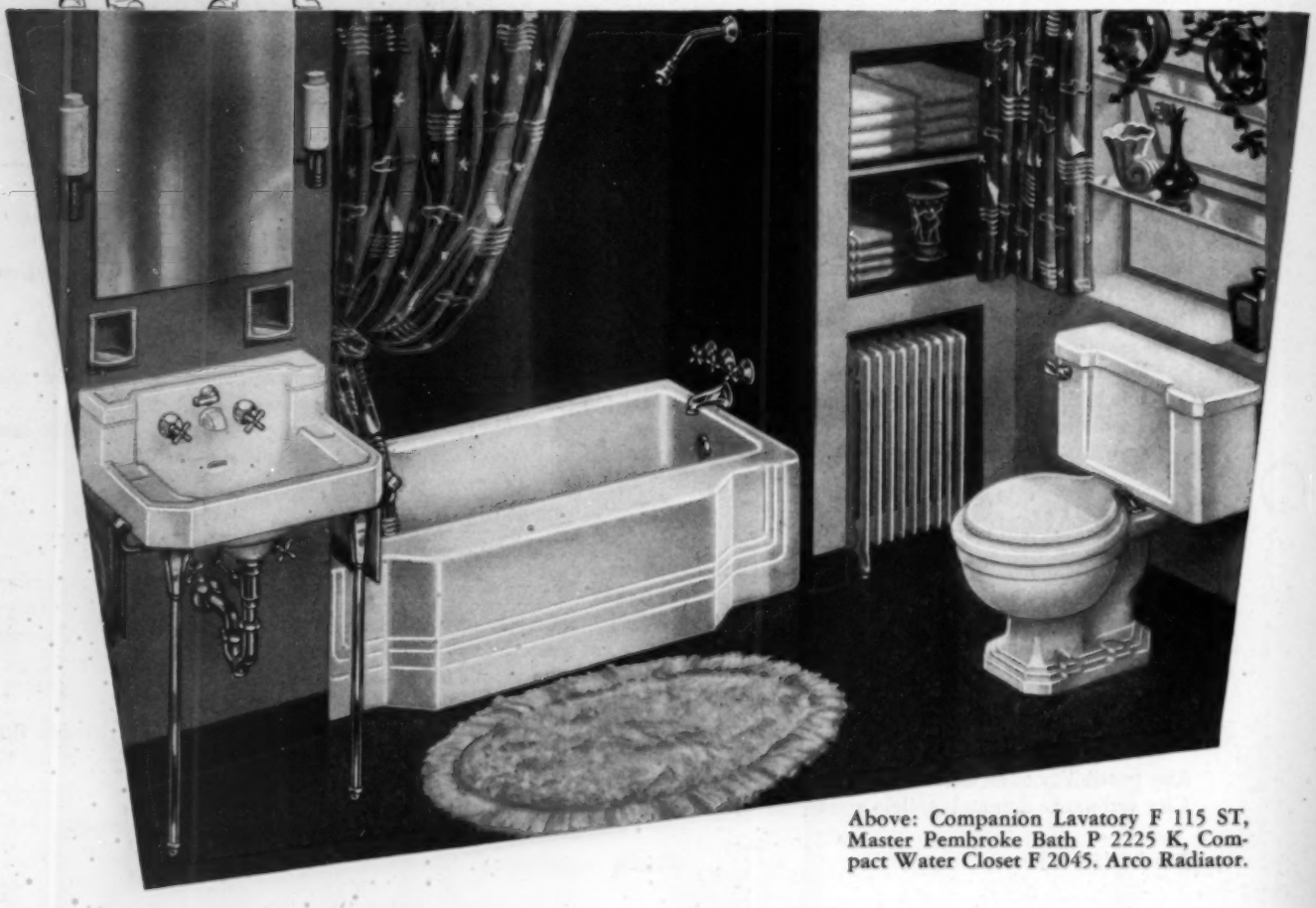
Dated.....

Signed..... *Pastor*

Signed..... *Licensed Architect*

Quality fixtures like these cost no more than others

—and they're just right for today's small homes



Above: Companion Lavatory F 115 ST, Master Pembroke Bath P 2225 K, Compact Water Closet F 2045. Arco Radiator.

WHEN IT COMES to specifying plumbing fixtures for those new homes and modernization jobs, the surest way to please is to recommend American-Standard. No name is better known. No products enjoy greater public acceptance.

The recessed Master Pembroke Bath, Companion Lavatory and Compact Water Closet shown above are typical of the smart, modern styling you'll find throughout the complete line. Like all products bearing the familiar American-Standard Mark of Merit, they are distinguished by their superb craftmanship, quality materials and sound construction.

With production and delivery conditions improving steadily, you're safe in specifying American-Standard bathroom fixtures, kitchen sinks and laundry trays. Your Plumbing Contractor welcomes an opportunity to figure with you. Fixtures for modernization can be bought on the Heating & Plumbing Finance Corporation convenient F.H.A. Time Payment Plan. **American Radiator & Standard Sanitary Corporation**, P. O. Box 1226, Pittsburgh 30, Pa.

AMERICAN-Standard

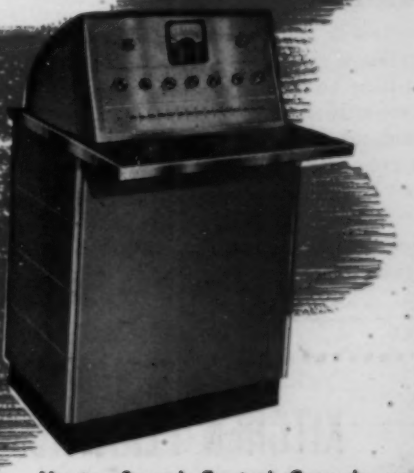
HEATING PLUMBING

Serving the Nations' Health and Comfort

LOOK FOR THIS MARK OF MERIT—It identifies the world's largest line of Heating and Plumbing Products for every use . . . including Boilers, Warm Air Furnaces, Winter Air Conditioners, Water Heaters, for all fuels . . . Radiators, Convectors, Enclosures . . . Gas and Oil Burners . . . Heating Accessories . . . Bathtubs, Water Closets, Lavatories, Kitchen Sinks, Laundry Trays, Brass Trim . . . and specialized products for Hospitals, Hotels, Schools, Ships, and Railroads

Unit-Built...

RCA MASTER SOUND CONTROL CONSOLES



Master Sound Control Console provides paging facilities to loudspeakers in 15 to 60 zones.

Master Sound Control Console with Record Transcription Unit and facilities for the distribution of speech and music to loudspeakers in 120 zones.

Master Sound Control Console with two Record Transcription Units, a Radio Receiver and paging facilities for distribution to 120 zones.

Whether your problem is sound distribution for a small paging installation or an elaborate plant broadcasting service— you can do it better with an RCA unit-built Master Sound Control Console.

A series of standardized frames and panels are matched to make up distinctly styled basic units. These matched units are so designed that it is possible to assemble them into any desired combination of unit-built Master Sound Control Consoles to fit the job.

No matter what your requirements—record transcription turntable, recorder, radio, or paging—so flexible is this equipment that the right combination of basic units can be provided to give you any or all of these services. As your sound-system needs develop, basic units can be added without discarding equipment already in use.

Built of "matched" units, RCA's Master Sound Control Equipment provides custom-built consoles within the price range of regular production-made equipment. You are assured of dependable performance at lower cost, for years to come.

For full information on the various *unit-built* combinations, write: Dept. 10-J, Sound Equipment Section, RCA, Camden, N. J.

SOUND SYSTEMS

RADIO CORPORATION of AMERICA

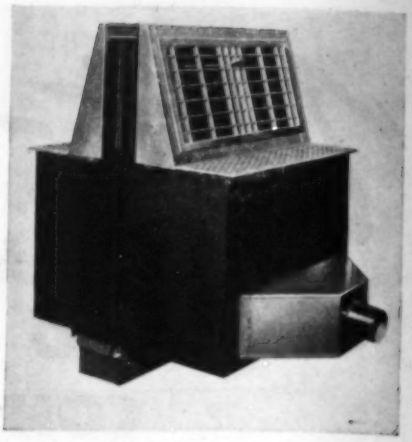
ENGINEERING PRODUCTS DEPARTMENT, CAMDEN, N.J.

In Canada: RCA VICTOR Company Limited, Montreal

(*Continued from page 129*)

HIGHER LUMEN RATINGS

Increases in the light output of fluorescent lamps, ranging from the miniature 6-watt lamp to the large 100-watt lamp have recently been announced. These increases, measured by initial (100 hour) lumen ratings, average approximately 5 per cent but run as high as 14 per cent in the case of the 15-watt soft-white fluorescent. Initial lumen ratings of the widely used 40-watt lamp have been raised 6 per cent for the 4500° white color, 11 per cent for the daylight, and 4 per cent for the soft white. The 100-watt lamp, which is used extensively in industrial installations, has rating increases of 3 per cent for the daylight and soft-white colors and over 4 per cent for the standard white. Similar increases have been made for the smaller 6-, 8-, 14-, 15-, 20-, and 30-watt lamps. Sylvania Electric Products, Inc., 500 Fifth Ave., New York, N. Y.



Dual furnace of shallow design is installed below floor without basement or pit

FLOOR FURNACE

Dual floor furnace, *Model D-45000*, is of shallow flat-bed construction. The fire-box is only 18 in. deep, so the furnace can be hidden below floor level and installed without the need of basement or pit. Shallow depth and welded construction are said to provide safeguard against danger of flooding in rainy season. Installation is made by cutting specified size holes in floor and wall, and slipping the furnace into place. Grills are so designed that no patching or painting is necessary afterwards. Pilot and burner valves are equipped with safety locks. This model has a 45,000 Btu input. *Model D-55000*, next in production, will have a 55,000 Btu input. Furnaces have the seal of approval of the American Gas Association. Royal Heaters, Inc., Dept. AR, 1024 Westminster Ave., Alhambra, Calif.

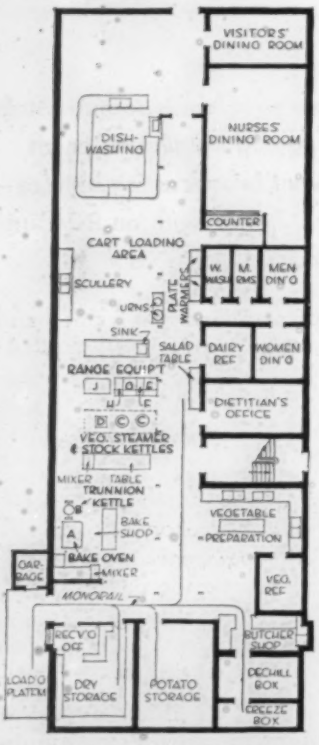
SINGLE-SEATED VALVES

A new line of single-seated fully balanced diaphragm regulating valves is being manufactured for process industries and power plants. These diaphragm valves are made with cast iron, bronze, and steel bodies for steam, air, or gas pressures up to 1000 psi., and are designed to be actuated by standard pressure or temperature instruments or controllers using 20 psi. air or clean water. Supplied as standard equipment with 800 Brinell hardened stainless steel main valves and stellited seat rings, they are said to provide equal or greater capacities than most double-seated regulating valves of the same size, and to have the additional advantage of being absolutely tight in dead-end service. For temperatures over 450° F., steel diaphragm valves are equipped with *Conden-Seal* cooling bonnet, designed to provide a large radiating surface and a reservoir of condensate to help keep the stuffing box temperature down. Leslie Co., 57 Delafield Ave., Lyndhurst, N. J.

(*Continued on page 140*)

KITCHEN PLAN NO. 37: Thirty-seventh of a series of successful mass-feeding kitchen plans.

This plan has been designed for an "off-the-track" hospital of 125 beds, located near a small city in the West.



KEEP FOR HANDY REFERENCE!

COOKING EQUIPMENT PROPOSED:

(a) 1 No. 982 BLODGETT GAS-FIRED BAKING OVEN.
(b) 1 20 gallon trunnion kettle
(c) 2 Stock kettles
(d) 1 Vegetable steamer
(e) 1 Solid top skeleton range
(f) 1 Open range extension
(g) 1 Open top skeleton range
(h) 1 Deep fat fryer
(j) 1 No. 959 BLODGETT GAS-FIRED ROASTING and GENERAL COOKERY OVEN.

This layout was designed with an eye toward adequate cleaning space and the elimination of employee fatigue. In addition to patients and a staff of eighty, provision has been made for supplying meals to a limited number of visitors. The No. 982 Blodgett Bake Oven is an eight-pan, two-section unit, and the No. 959 an oven with two sections, one with two 7″ compartments and one with a 12″ compartment.

The G. S. BLODGETT CO., Inc.
50 Lakeside Avenue Burlington, Vermont

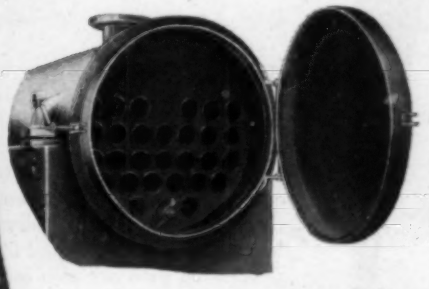
The new Deluxe edition of Case Histories is ready—write for it now!

TITUSVILLE *Compact* STEEL HEATING BOILERS

ARE EASY-TO-CLEAN AND EASY-TO-KEEP CLEAN

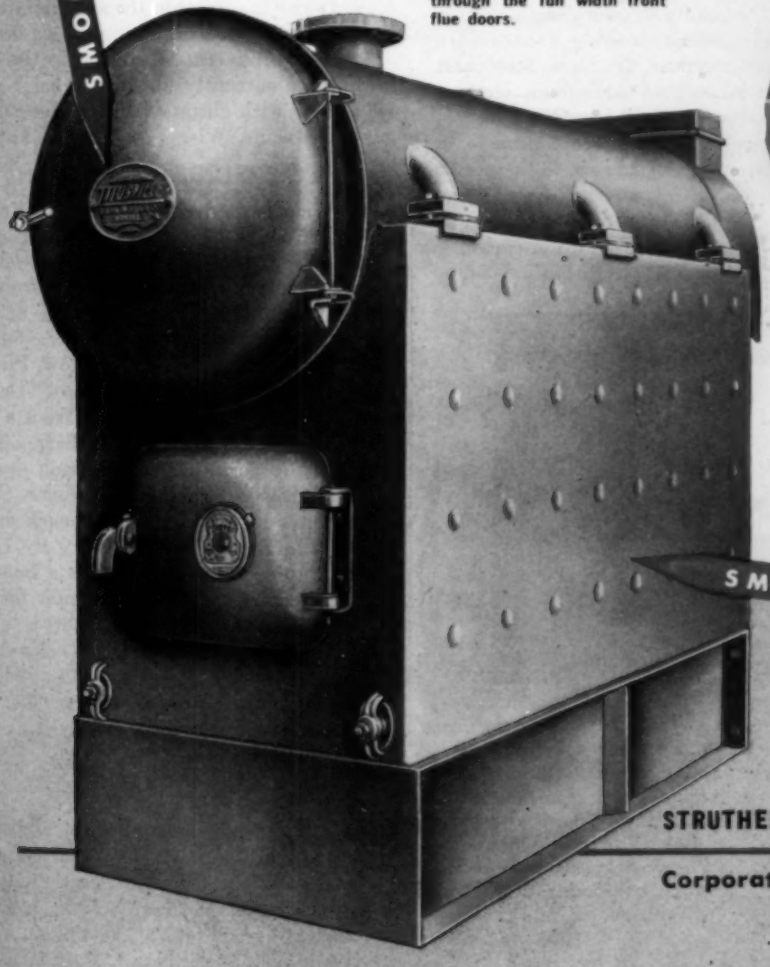
KEEP A STEEL BOILER CLEAN AND YOU WILL ADD MANY YEARS TO ITS LIFE

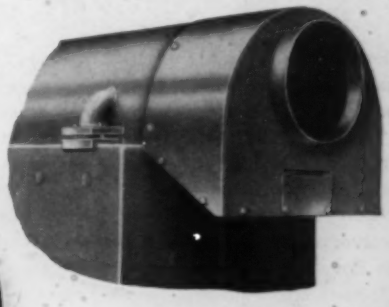
SMOOTH SURFACES



For cleaning the waterlegs, four 3" x 4" handhole openings (one at each corner) make it possible to flush out all water surfaces; while the shell can be blown clean under pressure through the clean-out opening in the rear circulator. An additional handhole opening is provided at the bottom of the front head and manholes in all sizes having shell diameters more than 48". Two 2½" blow-off openings at the water line are provided in all sizes. Write for Bulletin No. 3000-A.

All tubes are readily accessible through the full width front flue doors.





The bottom of the rear smoke box slopes away from the upper tube bank so that soot accumulations can quickly be removed through the smoke box clean-out opening.

Member of SBI

Reg. U. S. Pat. Off.

SMOOTH SURFACES

KEEP A STEEL BOILER CLEAN AND YOU WILL ADD MANY YEARS TO ITS LIFE

STRUTHERS WELLS Corporation

TITUSVILLE IRON WORKS DIVISION TITUSVILLE, PENNA.

(*Continued from page 138*)

WOOD-METAL LAMINATE

Sheet metal with a thin wood veneer, formerly called *Decorative Armorply*, will henceforth be known as *Flexmetl*. This is the new laminate consisting of a hardwood veneer, only 1/85th to 1/28th of an inch thick, bonded to a sheet of metal. The finished material is reported to be flexible to the limit of the sheet metal used. U. S. Plywood Corp., 55 West 44th St., New York 18, N. Y.

PROPELLER UNIT HEATERS

A new and restyled line of propeller unit heaters has been announced featuring three distinct types of units with a total of 47 basic capacities. To the conventional horizontal and vertical delivery types, there has been added a powerful new draw-through unit which provides horizontal discharge of heated air over an extra-long range. Known as the *Power-Throw*, this type has specialized applications, and may be used alone or in combination with the horizontal or vertical type. All are available in standard models as well as in models designed to provide low-outlet air temperatures when used on steam pressures of 30 lb. or more. Models specifically designed for hot water application and for drying and processing jobs are also included in the new line. A wide range of heat throw patterns is available through the use of air-distribution devices, such as deflectors and louvers. All models in the new line are currently finished in beige-gray enamel with chrome trim. Modine Mfg. Co., Racine, Wis.

Draw-through heater has extra-long range

COLOR GUIDE

Architects, decorators, and their clients frequently encounter difficulties in making color selections. Often a client will be given some color chips furnished by the manufacturer and will narrow his selection down to two colors, following this with the request, "Now, I'd like a color in between those two." Or the home owner selects a color from a mix in the wet state, and is disappointed with the variation shown upon drying. The *Moleta Architectural Color Guide* displays 150 different colors, each shown on a large page measuring 9 by 15 in. The guide is said to prove a boon to architects because the formula for obtaining each particular color is given clearly on the reverse of each color sheet. Colors are shown as they will appear in the dry state. Monroe, Lederer & Taussig, Inc., 606 North American St., Philadelphia 23, Penn.

NEW NAME

Announcement has been made of the change in name of Sanimetal Corporation to Vikon Tile Corporation, which will continue to manufacture steel wall and ceiling tile of various colors. Vikon Tile Corp., Washington, N. J.

(*Continued on page 154*)

Win Lasting "Client-Goodwill"

INTERIOR TRIM

Create more Visible Value with KINTRIM *Essential Metal Mouldings*

KINTRIM allows you free play in graceful modern design . . . and wins lasting recognition for your creative touch by adding more *"visible value"* to your interiors. For KINTRIM—the lustrous metal mouldings of *enduring beauty*—has the structural precision you want . . . *you need* for more attractive, practical use of colorful, serviceable coverings. Indeed, wherever you install linoleum, wall- and floor-coverings, KINTRIM smartly enriches and accents the beauty of your design.

As experienced, leading contractors recognize—KINTRIM Stainless Steel and KINTRIM Alumilited Aluminum sections surpass ordinary metal mouldings in protective service. They're precision-made, in a complete range of gauges, to fit specific weights of covering materials. And, to protect hands and clothes against snagging, every KINTRIM Stainless section embodies Kinkead's special Safety Rolled-Edge.

kintrim
TRADE MARK

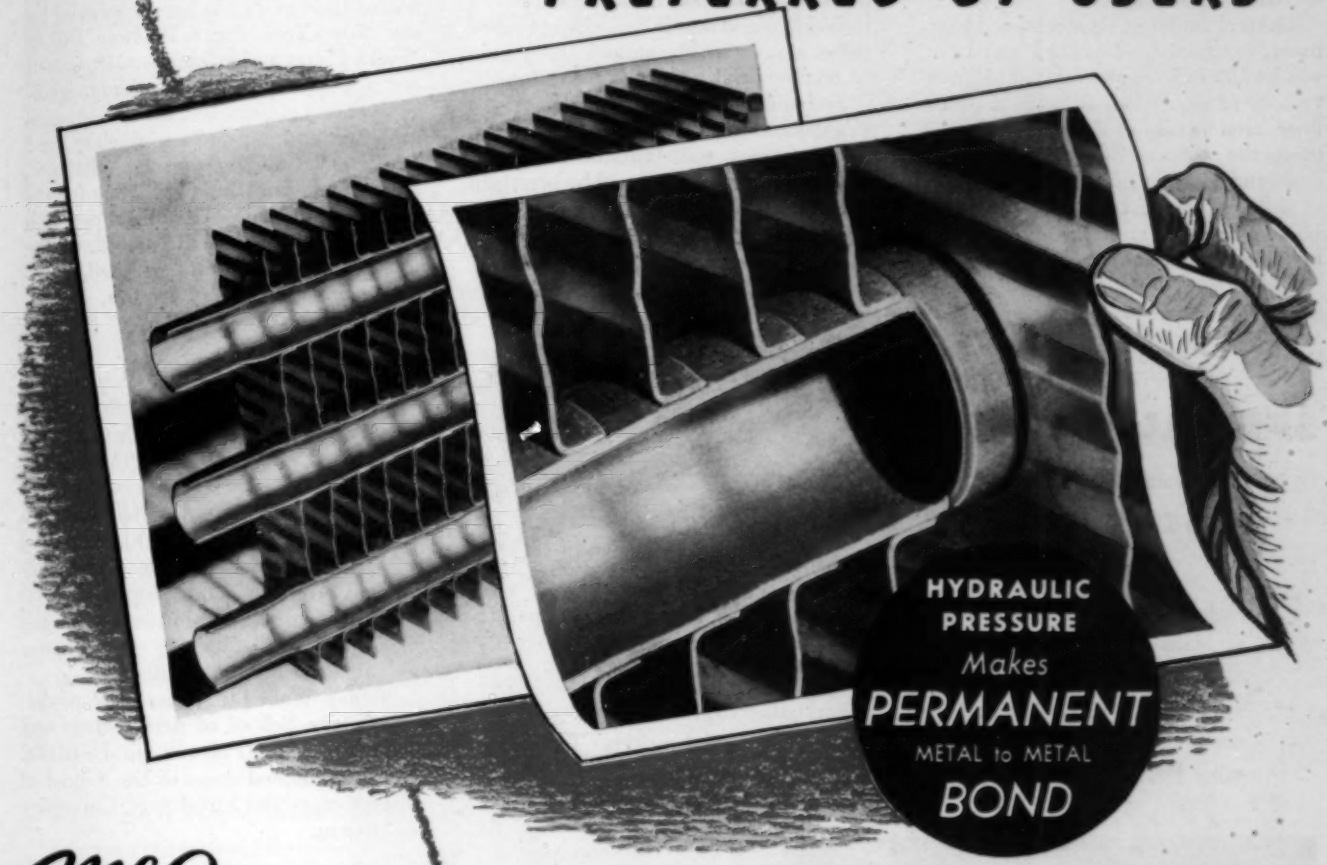
KINKEAD INDUSTRIES
INCORPORATED

440-450 W. SUPERIOR STREET, CHICAGO 10, ILL.

Let KINTRIM *beauty and utility serve as your creative finishing touch that adds more "visible value" . . . and wins clients that speak for you. Write us, Dept. 10R, for reprint of* KINTRIM *section, Architects' File, 1946 Sweet's Catalog.*

Copyr. 1946, Kinkead Industries, Incorporated

PROVED BY PERFORMANCE
PREFERRED BY USERS



McQuay HYDRAULICALLY EXPANDED RIPPLE FIN COILS

Permanent contact between tubes and the *entire* surface of the fin collars—that's the advantage of hydraulic pressure used to create the lasting mechanical bond on McQuay Ripple Fin Coils. And this significant advantage is a typical example of how a seemingly small detail in engineering design plays an important part in making a superior product.

McQuay construction means higher flexible strength with less air friction and cleaner operation. To provide maximum flexibility, all headers are of non-ferrous tubes, thus reducing the problem of unequal expansion and contraction.

These exclusive features make McQuay performance possible and establish their preference among users. McQuay coils are available in a wide variety of styles and sizes, both standard and special coils for steam, hot water, cold water, brine, direct expansion and other applications. For complete information write McQuay, Inc., 1605 Broadway Street N. E., Minneapolis 13, Minn.

McQuay

. . . AIR CONDITIONING EQUIPMENT ESPECIALLY DESIGNED FOR INDUSTRY

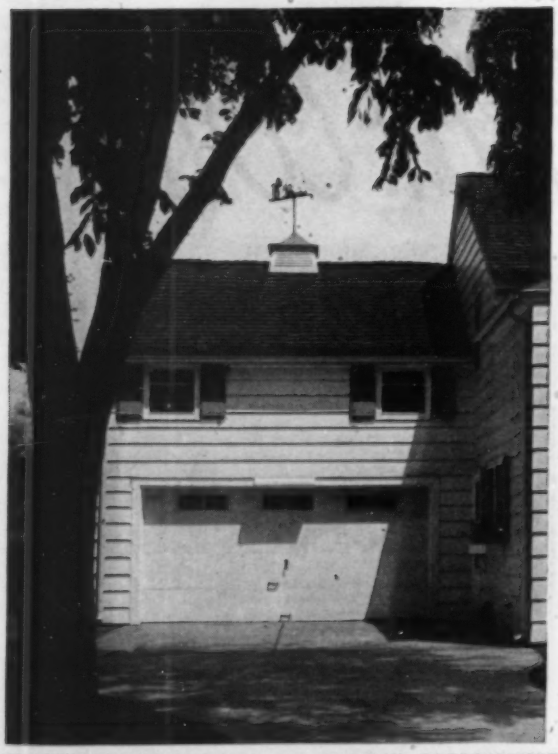
extensive postwar building program, was started early last month.

The new building, six stories and basement, designed by Holabird and Root, will be 220 ft. long and 50 ft. wide, containing 1,001,600 cu. ft. with a usable floor area of about 56,500 ft. It will house the offices of the chancellor, president and vice presidents, the secretary of the board of trustees, the comptroller, bursar, business manager and purchasing office, the dean of students, registrar, admissions, student counseling and the university examiner. The university's radio office and studio also will be housed there, along with the alumni office, public relations and university postoffice.

Foundations will be pile footings. Frames and slabs will be reenforced concrete, exterior walls cutstone, and the roof tile. Interior finish will be plastered with the walls painted; ceilings will have acoustic tile; floors will be terrazzo in public and asphalt tile in office areas.

WHEN YOU NEED
SPECIAL-DESIGN GARAGE DOORS
SPECIFY
Barcol OVERDOORS

Where standard panel arrangements would clash esthetically, special sections can usually be made to complement the exterior design. With this added distinction you keep the outstanding Barcol OVERdoor features . . . tailored twin-torsion counterbalancing, roller-crank closing action, self-latching bolts, continuous vertical track brackets. Talk with your Barber-Colman representative about the possibilities . . .



BARCOL

FACTORY-TRAINED SALES and SERVICE REPRESENTATIVES IN PRINCIPAL CITIES

BARBER-COLMAN COMPANY
102 MILL ST. • ROCKFORD, ILL.

Construction Program

Construction of five new buildings for the State Agricultural and Technical Institute and the College of Ceramics at Alfred University has been approved by the New York State Postwar Public Works Planning Commission. Projected are a home economics building, gymnasium and auditorium, farm mechanics building and an industrial shop and laboratory building for the Institute, and an industrial design building for the College of Ceramics. The total program will cost an estimated $1,236,662, will be under the direction of Haskell, Considine and Haskell of Elmira, N. Y., architects for the project.

Appointments

Oscar D. Rickly, an Ohio State University staff member for more than 25 years in the industrial engineering department, has been advanced from associate professor to a full professorship.

Charles A. Miller, assistant director of the School of Architecture of International Correspondence Schools, has been appointed to serve as a member of the Civic Design Committee of the Pennsylvania Society of Architects.

Sidney Wahl Little, associate professor in The School of Architecture and Arts, Alabama Polytechnic Institute, has been named dean of the School of Architecture and Allied Arts, University of Oregon.

ON THE CALENDAR

October 7–11: National Exhibition of Gas Appliance Manufacturers and Annual Convention, American Gas Association, Atlantic City, N. J.

October 10–12: 13th Annual Meeting and 1st Annual Exhibit on Building and Maintenance Products, National Association of Housing Officials, Carter Hotel, Cleveland, Ohio.

October 29–November 1: 4th All-Industry Refrigeration and Air Conditioning Exposition, Cleveland Public Auditorium, Cleveland, Ohio.

November 11–16: 39th Annual Convention, National Association of Real Estate Boards, Atlantic City, N. J.

November 17–22: 27th Annual Meeting, American Welding Society, Hotel Ambassador, Atlantic City, N. J.

November 18–22: 28th Annual National Metal Congress and Exposition, Municipal Auditorium, Atlantic City, N. J.

December 2–7: 17th National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York City.

January 23–26, 1947: 2nd Conference and Exhibit, Low-Pressure Division, The Society of the Plastics Industry, Edgewater Beach Hotel, Chicago.

January 27–30: 28th Annual Conven-

(*Continued on page 144*)

IT'S BUILT FOR *Beauty*

Modern in design with beautiful chrome finish.

IT'S BUILT FOR *Duty*

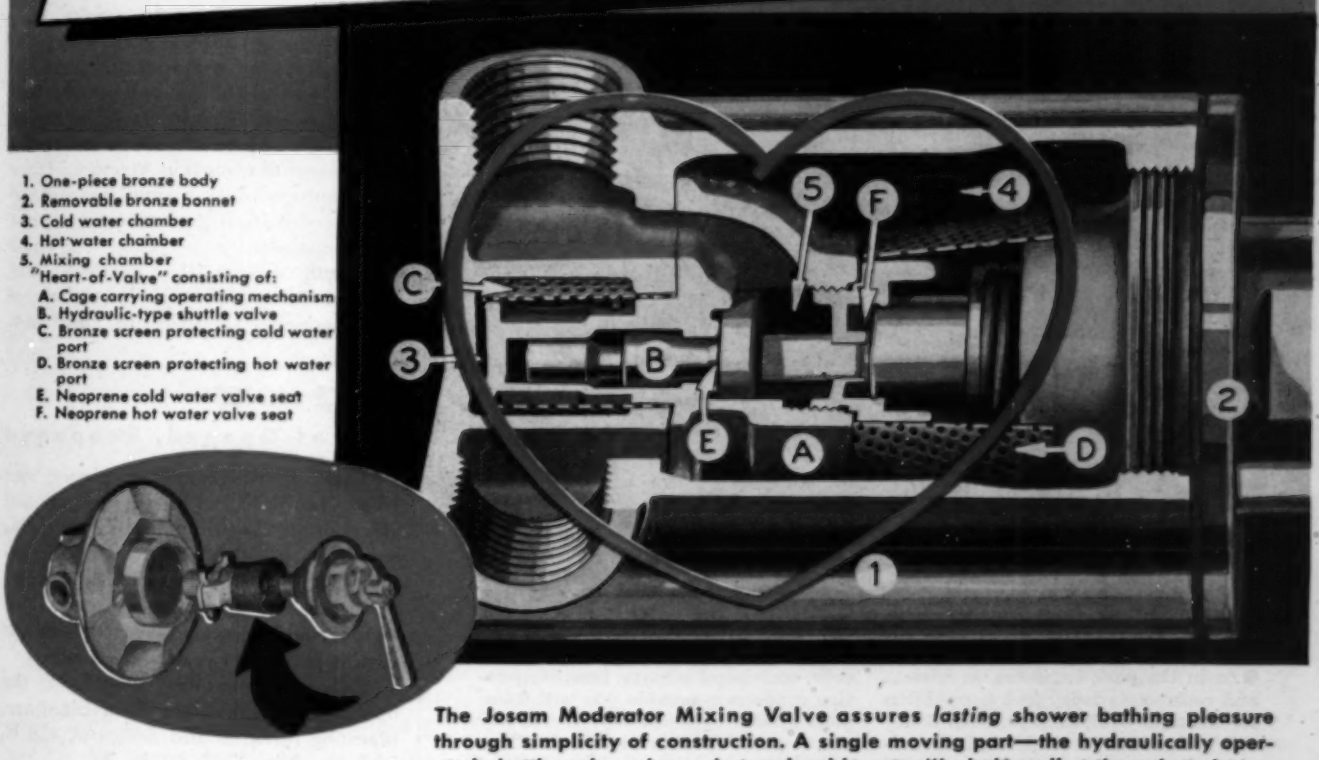
All working parts are of heat-resistant non-corrosive bronze.

...AND IT'S "Tops" IN *Shower Protection*

No accidental scalding; hot water shuts off when cold water fails.

Josam scald-preventing MODERATOR SHOWER MIXING VALVE

WITH *exclusive* HEART-OF-VALVE CONSTRUCTION



Maintenance is simple and easy. All working parts are combined in the "heart of valve" unit easily accessible by removing valve bonnet. Old unit can be removed and new unit installed in a jiffy. "Heart of valve" renewal units are available in individual packages.

The Josam Moderator Mixing Valve assures *lasting* shower bathing pleasure through simplicity of construction. A single moving part—the hydraulically operated shuttle valve—keeps hot and cold water "in balance" at the selected temperature and prevents accidental scalding. This shuttle valve is enclosed in the "heart of the valve"—a unit in which all working parts are combined. Even after years of wear or rough usage, there is no need of expensive replacement. All you do is replace the old "heart of valve" with a new one...and the valve is as good as new! The Josam Moderator Mixing Valve is ideal for residences, apartments, schools, colleges, hotels, clubs, institutions, factories, or wherever shower bathing is a regular routine. Fits readily into all standard shower installations. Send coupon below for complete details today!

JOSAM MANUFACTURING COMPANY

CLEVELAND 14, OHIO — PLANT, MICHIGAN CITY, INDIANA

Representatives in all Principal Cities

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See our Catalog in Sweets' — Member of the Producer's Council

JOSAM MFG. CO. 302 Ferguson Bldg., Cleveland 14, Ohio

Send new literature on Josam Moderator Mixing Valve to

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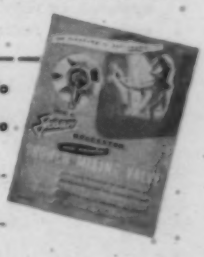


tion, The Associated General Contractors of America, Inc., Stevens Hotel, Chicago.

January 27–31: 7th International Heating and Ventilating Exposition, Lakeside Hall, Cleveland, Ohio.

January 27–31: Electrical Engineering Exposition, and Winter Convention, American Institute of Electrical Engineers, 71st Regiment Armory, New York City.

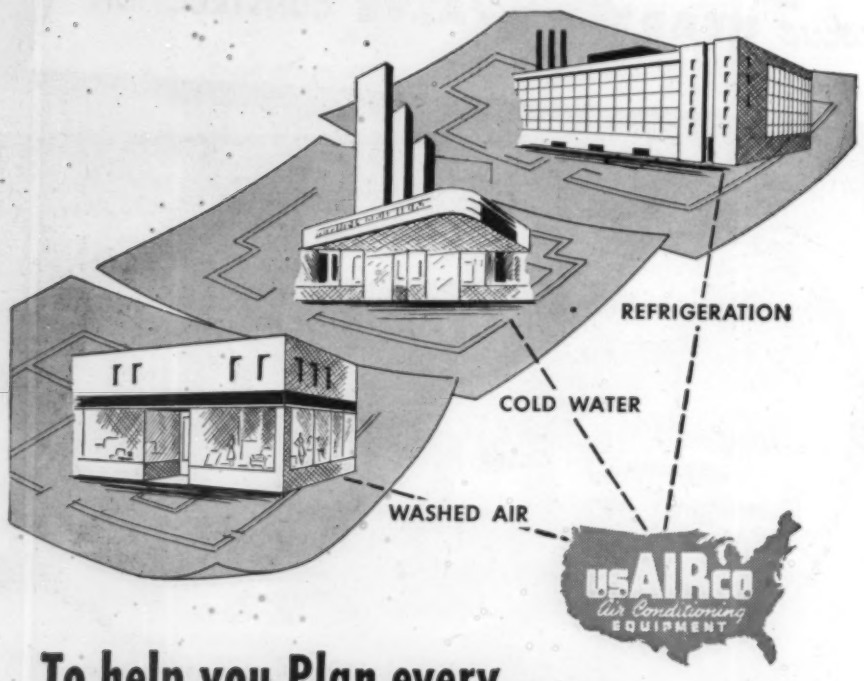
January 28-February 2: 3rd Annual Plastics Show and Convention, The Society of Plastics Engineers, Navy Pier and Congress Hotel, Chicago.

May 5–11: 2nd National Plastics Exposition and Annual Convention, The Society of the Plastics Industry, Coliseum, Chicago.

ON CHAIR DESIGN

In the first issue of the "Streamliner," a newssheet published occasionally by Egmont Arens of New York, is the following description of the work of a modern industrial designer:

"The Industrial Designer's job is to make the machine better to serve man. . . . For instance, for the last few months we have been working on a machine for sitting — commonly known as a chair. We have been spending a lot of time trying to make that chair more comfortable than any chair any body ever sat in. A large order, because people's rear ends come in the most amazing assortment of sizes and shapes. You might say that technically our effort is to get the least common denominator of the human fanny. So we have staged a sit down strike of our own. We asked all and sundry to sit down on a piece of clay, until we got composite impress of their nether ends. For artistic inspiration we induced some of Powers' most glamorous models to sit in our embryo chair. This phase of the development was very popular with the boys on our staff, who took measurements of some of the prettiest tails in our town. As you know, our building is full of photographers, hence 'through these portals pass some of the most beautiful women in America.' If we have captured only a small percentage of the pulchritudinous curvatures that were impressed in our clay, our chair will rank among the greatest, and Egmont Arens will march down the ages with Heppelwhite, Sheraton, and Chippendale."



To help you Plan every...

AIR CONDITIONING JOB

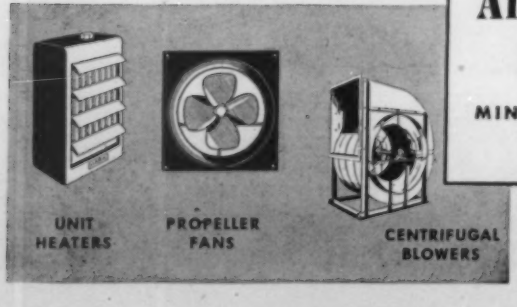
● As in the past, engineers, architects and contractors today *look to* USAIRCO for the right equipment for each job.

Whether it be an economical washed-air cooling system, a cold water unit for deep well operation, or a refrigeration system for complete air cooling and dehumidification, there's a USAIRCO system engineered for your job. Year 'round air conditioning is also available, cooling in the summer and heating in the winter.

USAIRCO systems are designed for "packaged" installations, central station systems, or remote type units. Auxiliary equipment such as unit heaters, heat coils, centrifugal blowers, fans, evaporative condensers provide you with complete system responsibility. It will pay you to get in touch with your USAIRCO representative . . . take advantage of *specialized experience and engineering leadership.*

I.C.I.

Factory Representatives in Principal Cities



United States Air Conditioning Corporation

MINNEAPOLIS 14, MINNESOTA

USAIRCO Air Conditioning EQUIPMENT

Makers of the most complete line of air handling equipment

OFFICE NOTES

Offices Opened, Reopened

Sidney F. Bamberger, Engineer, and John Lyon Reid, Architect, have opened offices under the firm name of Bamberger and Reid at 110 Market St., San Francisco 11, Calif., for the practice of architecture and structural engineering. Both men formerly were associated with the Ernest J. Kump Co. of San Francisco.

Marcel Breuer has announced the opening of a new office for architecture, planning research and design at 438 E. 88th St., New York 28, N. Y.

Erich Gnant, Residential and Commercial Designer, has reopened his offices at 3331 W. Lisbon Ave., Milwaukee 8, Wis.

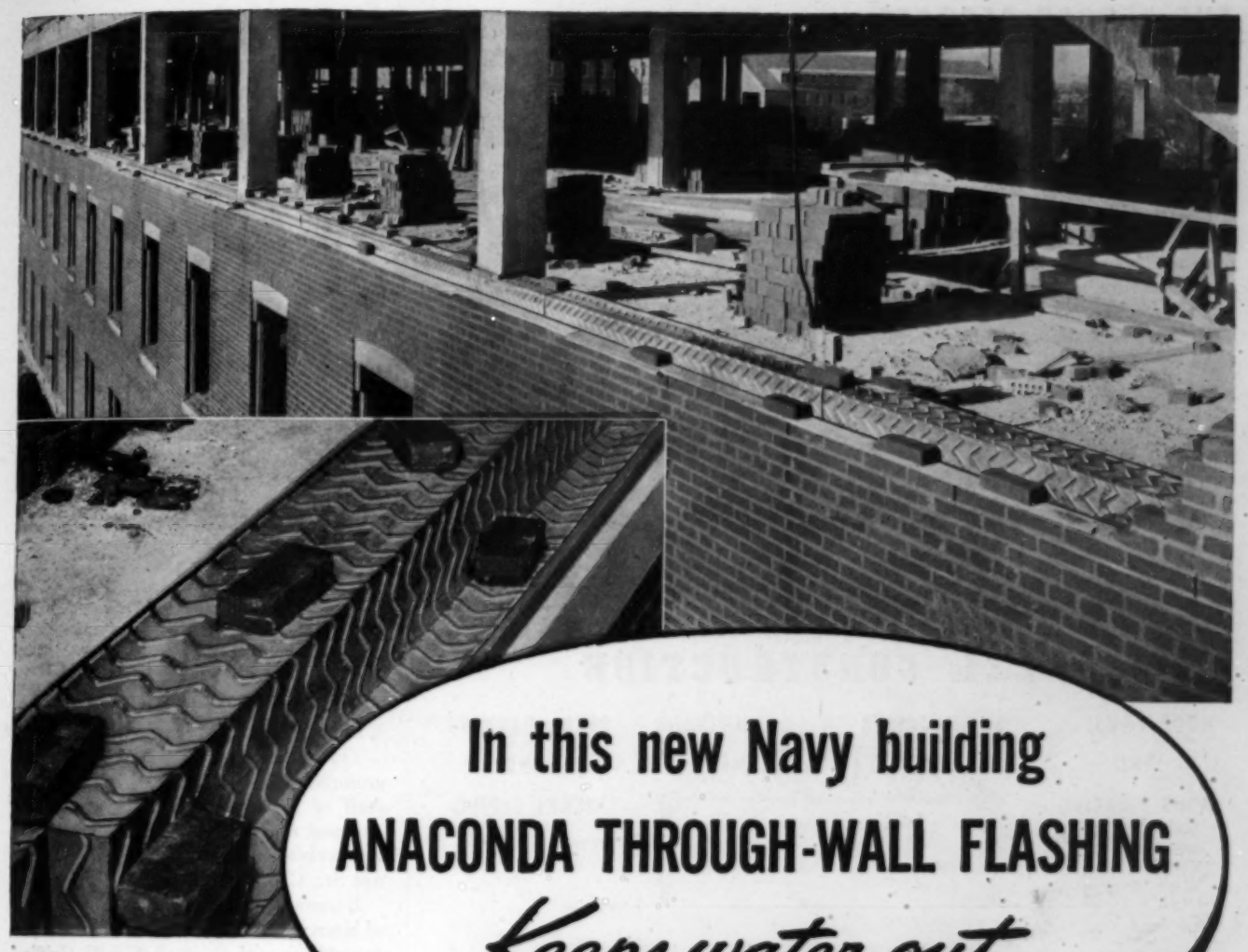
S. Porter Graves, Jr., and Walter D. Toy, Jr., have opened offices for the general practice of architecture as Graves & Toy, Architects, at 1100 S. Clarkson St., Charlotte, N. C.

Thomas E. Greacen, II, Architect, has announced the opening of his office at 1010 Winbern St., Houston 4, Tex.

Don Hatch, Architect, has reopened his office at 207 E. 32nd St., New York, after duty with the U. S. Marine Corps.

J. Lawrence Hopp, A.I.A., has resumed the practice of architecture, with offices at 654 Washington Rd., Mount Lebanon, Pittsburgh 16, Penn.

(*Continued on page 146*)



In this new Navy building
ANACONDA THROUGH-WALL FLASHING
Keeps water out

Anaconda 16 oz. Through-Wall Flashing in spandrel applications on new Navy building. J. D. Hedin Construction Co., Washington, D.C., General Contractor.

IN THE NEW Navy building illustrated above, the J. Edw. Linck Sheet Metal Works of Washington, D. C., installed 6,500 lb. of *the flashing that drains itself dry* . . . Anaconda Through-Wall Flashing.

This exceptionally effective flashing has been chosen for commercial, industrial, educational and institutional buildings throughout the country, because it offers these exclusive advantages:

1. Pre-stamped dam and corrugations which provide positive drainage.

2. Dam so designed that edge can be placed within ¼ inch of face of wall and still allow for pointing of mortar joint.

3. Flat selvage in which sharp bends can be made without distorting flashing.

4. Readily locked endwise to form thoroughly water-tight joints, by nesting one or two corrugations.

5. Corrugations provide a strong bond with mortar, and prevent lateral movement.

Write for Publication C-28, which contains complete description and specifications; or refer to Sweet's Architectural Catalog.

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THE RECORD REPORTS (*Continued from page 144*)

Edwin G. Johnson and John M. Whitcomb have announced the opening of their office under the firm name of Johnson & Whitcomb, Architects, at 44 Brattle St., Cambridge, Mass.

Lt. Com. Derick B. Kipp, U.S.N.R., has announced his release from active duty and his resumption of the practice of architecture, with offices at 425 Valley Rd., Montclair, N. J.

C. William Palmer, recently released from active duty with the Navy, has reopened his office for the practice of architecture and engineering at 2675 Penobscot Bldg., Detroit 26, Mich.

James Silhanek, Architect, has opened offices at 362½ D St., San Bernardino, Calif.

New Addresses

The following new addresses have been announced:

Asphalt Tile Institute, 101 Park Ave., New York 17, N. Y.

Bodin & Lamberson, Architects (Daniel H. Bodin and Willard N. Lamberson, and Clarence A. Smith II, Associate), 827 Forsyth Bldg., Atlanta, Ga.

George A. Ebeling, R.A., Suite 234, Colonial Arcade Bldg., Cleveland 15, Ohio.

Kemper Nomland, A.I.A., 623 W. 5th St., Los Angeles 13, Calif.

Ketchum, Giná & Sharp, Architects (Morris Ketchum, Jr., Francis X. Giná and J. Stanley Sharp), 227 E. 44th St., New York 17, N. Y. Effective about Nov. 1, 1946.

Palace Hardware Co., Inc., 53 Stevenson St., San Francisco, Calif.

Clarence O. Peterson and Wendell R. Spackman, Architects, 593 Market St., San Francisco 5, Calif.

Edward M. Pitt, R.A., 2606 Wilson Blvd., Arlington, Va.

Herbert M. Tatum, Architect, 2812 Fairmount St., Dallas 4, Tex.

Gerad W. Wolf, Architect, 2518 Holmes St., Kansas City 8, Mo.

Firm Changes

The Asphalt Tile Institute has announced the appointment of Charles B. Whittelsey, Jr., as managing director.

The Clay Sewer Pipe Assn., Inc., has announced the addition to its technical staff of Edward A. Walker as district engineer representing the Association in Pennsylvania. His office is at 503 Chestnut St., Greensburg, Penn.

Baumann and Baumann, Architects, of Knoxville, Tenn., have announced the association with them of Will W. Griffin, A.I.A., formerly chief architectural designer, Robert and Co., Atlanta.

Thomas J. Biggs, A.I.A., Harry E. Weir, A.I.A., and Sydney W. Chandler, A.S.C.E., have announced formation of the firm of Biggs, Weir and Chandler, Architects, Consulting Engineers, with offices at 224 N. Congress St., Jackson, Miss.

Ralph Bryan, Architect, who had returned to the practice of architecture in Dallas, Tex., following four years of service with the Seabees, has been recalled by the Navy for several months of active duty with the U. S. Naval Mission in Lima, Peru. He is serving as Captain in the Civil Engineering Corps Reserve.

Ernest J. Kump and Mark Falk have announced the return of their former partner, Lt. Col. Charles H. Franklin, A.U.S., Corps of Engineers, and the formation of the firm of Franklin, Kump & Falk, for the practice of architecture and engineering. Address, 9 Main St., San Francisco, Calif.

Wallace W. MacDonald has been appointed by John W. Maloney, Architect, of Yakima and Seattle, Wash., to head his Yakima central office, succeeding Howard E. Miney who has been transferred to manage the Seattle branch

(*Continued on page 152*)

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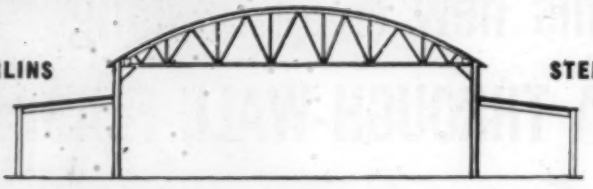

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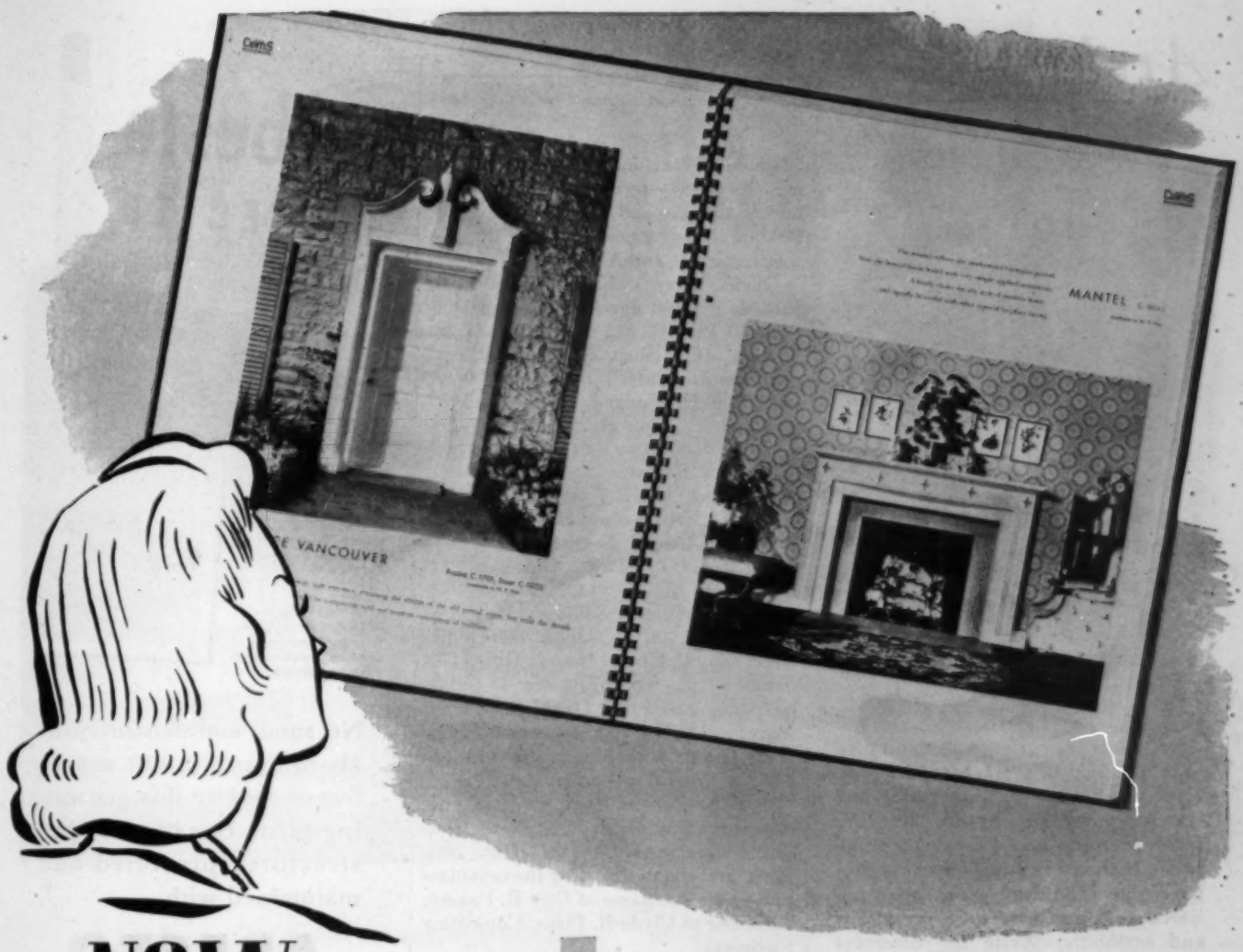

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THE RECORD REPORTS

(*Continued from page 146*)

office. Mr. MacDonald served as a Colonel with the Western Defense Command during the war and aided in the $139,000,000 construction program in the western states and Alaska.

David Maxwell has joined Bertell, Inc., design and development organization, 40 E. 49th St., New York 17, as director of product development and company associate.

Patrick D. Hongan, Architect, 1453 Tremont Pl., Denver 2, Colo., has announced dissolution of the firm of McCarter and Hongan.

Nashaat Morsy, A.F.S. "Eng." "Quant.," has been appointed architect to The Ghamra Bottling Company, Regal Brewery of Cairo. Address: P. O. Box 1731, Cairo, Egypt.

Mendelsohn, Dinwiddie and Hill (Eric Mendelsohn, A.I.A., John Dinwiddie, A.I.A., and Albert Henry Hill), 233 Sansome St., San Francisco 4, Calif., have announced that David B. Gideon, formerly Lt. Col. in the Corps of Engineers, U.S.A., is now associated with the office as general manager.

Guy B. Panero, engineer, has purchased the firm of Clyde R. Place, Consulting Engineers, Graybar Bldg., New York, and is now directing the organization under the name of Guy B. Panero, Successor to Clyde R. Place, Consulting Engineers.

Thorne Sherwood, A.I.A., Willis Nathaniel Mills, A.I.A., and Lester Wickham Smith, A.I.A., have announced the formation of a partnership under the firm name of Sherwood, Mills & Smith, for the practice of architecture and associated fields of design, with offices at 101 Park Ave., New York City and 4 South St., Stamford, Conn.

J. Archer Turner, president of the Turner Construction Co., has announced the return to the company, as a superintendent of construction, of Col. George M. Reaves, C.E., U.S.A. Col. Reaves was with the Turner Company for nine years prior to 1931 when he joined Wark and Co. of Philadelphia.

Donald F. White, A.I.A., Architect-Engineer, has announced his association with Francis E. Griffin, R.A., and the formation of the firm of White & Griffin, Architect-Engineer Associates, with offices at 1727 St. Antoine St., Detroit 26, Mich.

Announcement has been made of the formation of the firm of Thomas Worcester, Inc., to provide complete service including engineering, architecture and construction. Offices are at 84 State St., Boston 9, Mass. Thomas Worcester is president of the new firm, William Davies is chief architect, and Henry H. Harrison is chief of construction.

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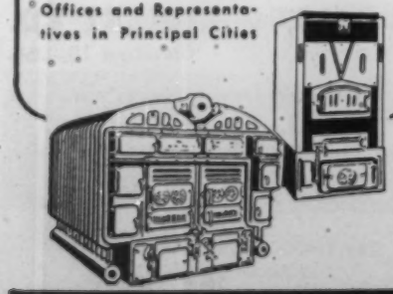
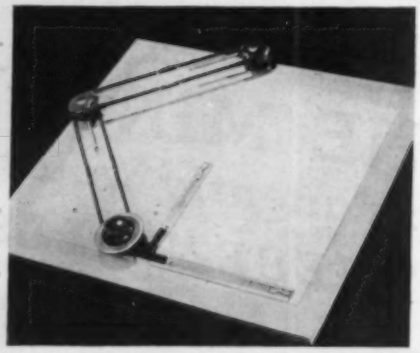


ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

(*Continued from page 140*)



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STANDARDS

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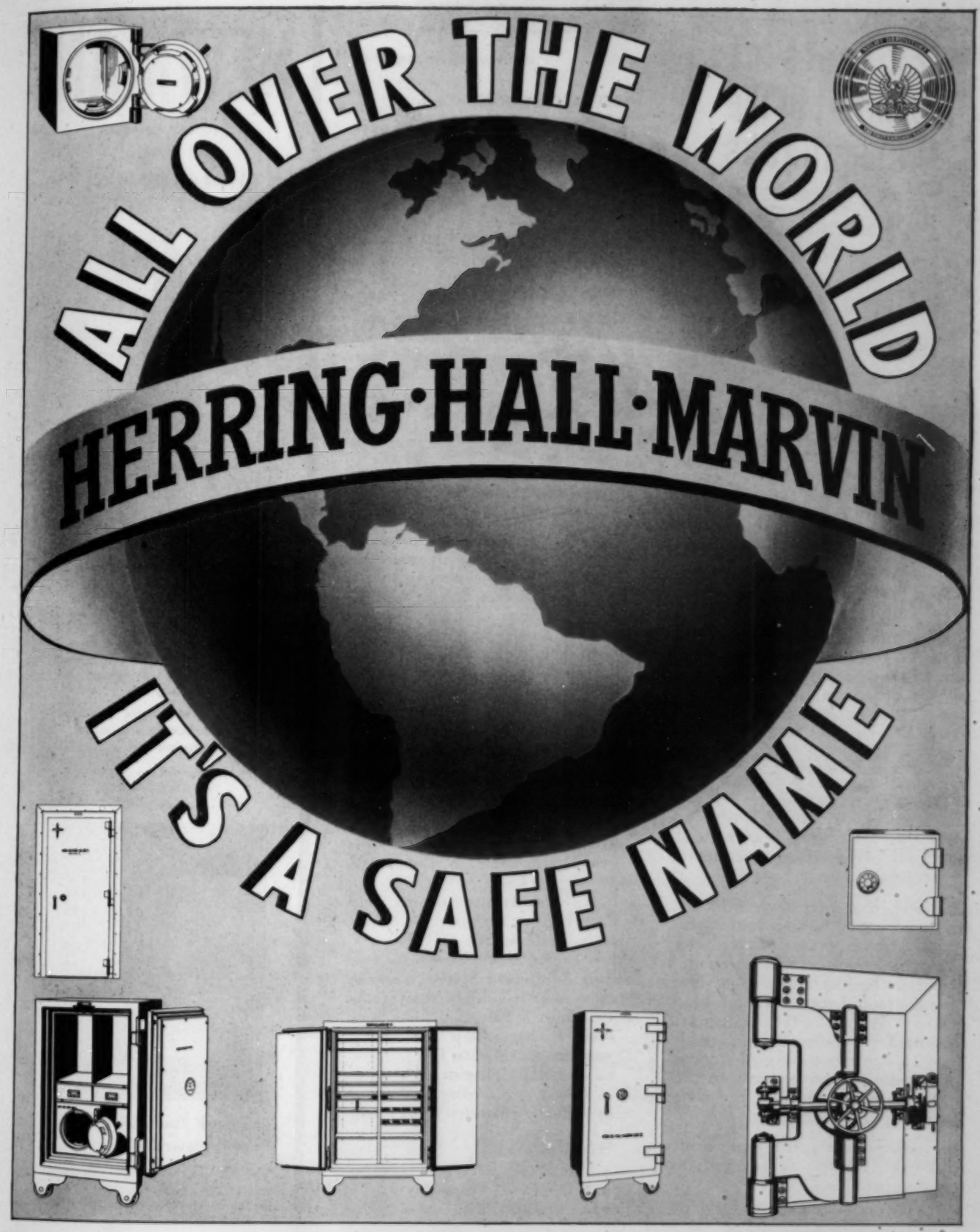

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